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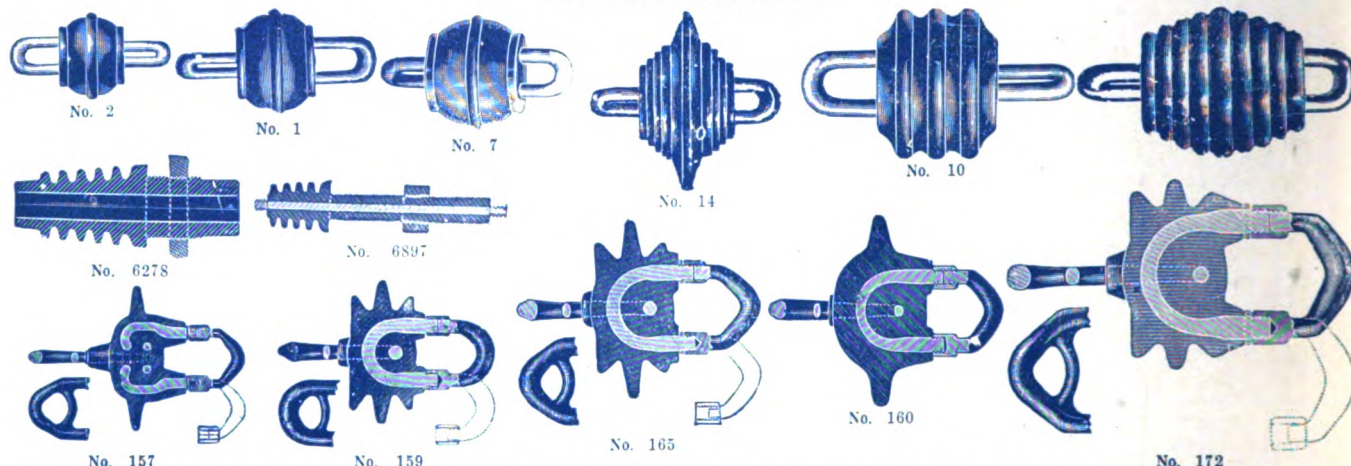
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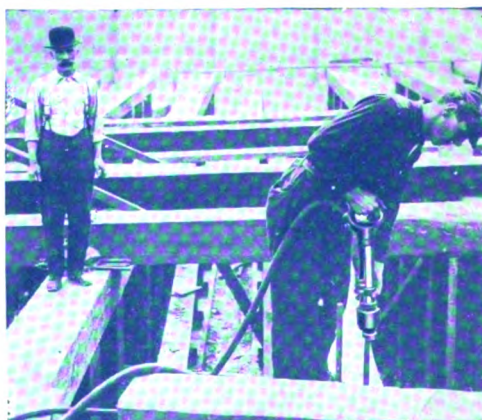
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No. 12

Sell Ships on a Fixed Schedule

Shipping Board Is Getting No Place Under Present Policy — Proposed Solution for Marine Problem

THE choking and repressive influence of federal interference in the field of business is again being revealed to the American public. The recollection of the disastrous experiment with railroad operation is sufficient to warn the average citizen what to expect.

This time the disclosures concern the marine industry and the part played by the shipping board in the shipping field. The means for arousing general interest are the hearings just opened before a special committee of the house of representatives. The report for guiding the direction of inquiry is an unusually complete survey of the board's activities. This report is published, almost in full, in the following pages.

Snap decisions are dangerous before both sides are heard, but in the case of governmental efforts to build and operate ships, little that is new can be told by either side. Specific instances of mismanagement, extravagance and paralyzing inefficiency arouse renewed condemnation but the system which they typify has always been understood. Rebuttal arguments reciting how plans and measures are being prepared to correct such conditions excite renewed interest, but convince nobody.

Solving Three Billion Dollar Puzzle in Three Words

Correction and remedy for the present condition under which the shipping board controls more than 7 seagoing merchant vessels out of every 12 in the American marine, lies not in the rephrasing of this agreement and the extension of that department; the solution is found in the 3-word slogan "sell the ships."

Every chairman of the shipping board, since thought was directed to the permanent policy for handling the war-born fleet, has announced publicly his conviction of the need for private ownership. The measures adopted to translate that conviction into action have accomplished little. Sales plans have been announced and then withdrawn in favor of others. Prices were set even above commercial limits and then brought

haltingly down grade—following but never overtaking or passing the falling market.

The slogan "sell the ships" is offered as the solution with full appreciation of the barriers that must be hurdled. For one thing, the job cannot be disposed of over night. Liquidating a \$3,000,000,000 investment on a falling market is work of the most critical nature, particularly when the fundamental principle of making the ships supply the nucleus for a permanent American merchant marine must always be kept in sight. But this same principle demands that the ships be sold and as quickly as possible.

A merchant under the necessity for liquidating his stocks does so by starting to sell—at the market if possible, but under the market if necessary. The essence of selling is to sell, a truism which the shipping board should carry into force. In the case of the board, this has in addition the practical command of the Jones act to withdraw from the commercial field at the earliest feasible date.

Making Ship Sales on Regular Schedule

This suggestion is offered to Admiral Benson, chairman of the board. Sell at least 25 ships a month. Sell them on a fixed day each month and sell them at the prices offered. Sell them as ships and not as scrap metal—bonds guaranteeing the performance of the sales agreement could insure this.

Even this rate of sale would require five to six years to sell all the ships and in that period, an upward market can be depended upon to bring better prices than the original sales. Those years would witness the development of a greater buying power for ships as the experience, financial strength and soundness of more and more marine firms is developed. This condition of a stronger buying power will result more quickly if a minimum schedule of ships are sold regularly and surely.

The months before the new administration are not necessarily a period for marking time. The ships must be sold. Why not start now?

Shipping Board Operation of Its DANGER OF PRESENT CONDITIONS

Special Investigators Call Attention to Lack of Sound Business Policy in Conduct of Shipping Board Affairs—Disclose How Daily Inroads on Treasury Are Being Made to Pay for Many Costly Governmental Blunders

EFFORTS of government officers to operate any business enterprise on sound commercial lines are impossible of successful accomplishment. The most striking example of the certain failure of such attempts is furnished today by the conduct of the shipping board. Carried along from 1917 to 1919 on the crest of the national determination to wage successful warfare, the shipping board was able to build up an immense fleet of ocean-going ships. Analyses of the colossal waste and losses were unpopular on the assumption that the forward march of shipbuilding might be retarded. Results alone were regarded as deserving of attention. The methods of obtaining such results were considered of minor

to meet commercial problems successfully is being revealed in the operation of this war-built fleet. Conditions are radically different now. While results are still of the major importance, the methods of securing these results are the determining factors in developing or defeating the intention of the American public to secure and maintain its commercial independence on the seas. American shipping has a sufficient barrier to success from unwise legislative restrictions without attempting to add to that burden the fundamental weaknesses of federal operation.

Public opinion will no longer tolerate the easy platitudes flowing so abundantly from Washington nor will it tolerate the reiterated but unkept prom-

importance. Just how ineffective were the efforts of sincere government officials in holding down the waste and inefficiency in the ship construction program is now clearly understood. The same failure

What the Report Seeks to Accomplish

IN CHARGE of the work of preparing this report for the select committee on shipping board operations, is A. M. Fisher, clerk and statistician. The committee itself was chosen by the house of representatives and is headed by Joseph Walsh, Massachusetts. Associated with Mr. Fisher is J. F. Richardson, assistant clerk and statistician of the committee. He has had 20 years of newspaper experience, subsequently becoming associated with the department of investigation of the shipping board.

In his introduction to the report, Mr. Fisher points out his own continuous connection with shipping board affairs since the beginning of the war. He prepared for the shipping board a survey of different departments and thus familiarized himself thoroughly with the operations of the board as well as with the personnel. He makes clear that his investigations have not been designed to give offense to any official of the shipping board, but were intended to secure the whole-hearted co-operation of the board itself. For that reason, the results of his work have been consistently placed before the board.

"While I desire to give full credit to the United States shipping board," says Mr. Fisher, "for its accomplishment of having constructed and launched, under abnormal and adverse

conditions, such a fleet of ships as it did, I feel that this task is fully equaled by the problem now confronting the shipping board of creating and nourishing an American merchant marine. From this viewpoint the report presented herewith is a sketch of a proposed inquiry by this committee designed to deal first with the problems which now confront the shipping board and secondly with the problems presented in its past accomplishments.

"This report is not designed to deal with any question from the standpoint of legislative action, but with problems which can be solved wholly by the shipping board itself."

The report is not held up as the complete diagnosis of all the problems facing the board and the remedies suggested are largely offered as a basis from which to develop correct solutions.

The report covers the following general subjects:

1. Repair yards and practices.
2. Ship supply service.
3. Allocation of tonnage.
4. Managing and operating agreements.
5. Shipbuilding contracts and settlements.
6. Charters, rates, trade routes, etc.
7. Ship sales program.

The complete report covers only

briefly the seven topics indicated and does not enter into the following problems of equal importance:

1. Commandeered tonnage.
2. Requisitioned tonnage.
3. Reconditioning of obsolete and other tonnage.
4. Purchase of alien tonnage and criticism thereof.
5. Lumber program.
6. Organization of United States shipping board.
7. Assumption of diplomatic functions by United States shipping board officials.
8. Foreign shipbuilding contracts.
9. Foreign fuel and bunkering facilities.
10. Technical errors in construction program, including wood ships, lake boats (cut-in-two boats), composite boats, concrete boats, unco-ordinated purchase of supplies and equipment, and experiments in equipment.
11. German-American deals.
12. Wharfage and terminal facilities.
13. Enforcement of the merchant marine act (known as the Jones law).
14. Evasions of selective service law.

The house committee is urged to develop proper solutions for these problems as a means of establishing the merchant marine on an enduring foundation.

Fleet Imperils Merchant Marine OUTLINED TO SPECIAL COMMITTEE

ises to correct faults which gain general knowledge. Many marine men, therefore, expect definite results from the congressional investigation now under way despite their knowledge of the ineffectiveness of the majority of such hearings. The present committee headed by Representative Walsh, starts off with the advantage of possessing already a complete analysis of the fundamental weakness of the shipping board's policies acquired by the committee's own representatives after months of thorough investigation. The following pages carry liberal excerpts from the report made by these examiners.

Preliminary investigation revealed conditions of extravagance and inefficiency which are both amazing and intolerable. The official report discloses story after story of large and small extravagances, careless handling of money and fatal delays in obtaining steady operation of new American ships. Remedies are suggested for present conditions but generally in the direction of extending the shipping board organization as a means of providing a closer check on the outlay of money. To most marine men the solution will clearly lie in the opposite direction. In other words, the present report confirms with unanswerable force, the conviction that federal entrance into commercial enterprises brings only ruin and failure. The story told in the following pages calls for immediate solution, not by widening the powers of an inefficient board, but by curtailing powers until the American merchant marine can be solidly established on the fundamental basis of private ownership and operation.

Inefficiency in Handling Big War Built Fleet Threatens to Rob America of Her Right to Commercial Security on Ocean—Analysis Presented of Board's Futile Efforts to Find a Solution for a Tremendous Problem

dies are suggested for present conditions but generally in the direction of extending the shipping board organization as a means of providing a closer check on the outlay of money. To most marine men the solution will clearly lie in the opposite direction. In other words, the present report confirms with unanswerable force, the conviction that federal entrance into commercial enterprises brings only ruin and failure. The story told in the following pages calls for immediate solution, not by widening the powers of an inefficient board, but by curtailing powers until the American merchant marine can be solidly established on the fundamental basis of private ownership and operation.

Ship Selling Practices Block Sales

SHIP SALES PROGRAM

1. Merchant Marine Act

(a) *Provisions of.*—The merchant marine act is generally accepted to provide that United States shipping board tonnage shall be sold to such purchasers as can and will agree to keep the boats in operation under American registry. Failing in this, the shipping board may charter this tonnage; failing in this, the shipping board may then allocate the tonnage for operation under shipping board supervision.

(b) *Sale of tonnage.*—It is admitted by shipping board officials that the sale of shipping board tonnage is almost impossible of consummation under present practice. Not only are charges of discrimination made against the shipping board regarding the sale of tonnage, but it is further asserted practices of the shipping board discourage the purchase of its tonnage by operators. Another reason advanced for this is that purchasers of shipping board tonnage can not, under present freight rates, make the necessary 5 per cent to meet payments and at the same time carry the income tax. Another argument advanced is that the shipping board does not allocate for operation any tonnage to purchasers of other tonnage from the shipping board, in order to nurture such operating companies until they can finally own all of the tonnage. Another allegation

is that the shipping board brings the purchaser of tonnage into competition with managers and/or operators of tonnage assigned or allocated under conditions which are disadvantageous to the owner of tonnage purchased from the shipping board.

Although the merchant marine act stipulates that the responsibility of purchasers of shipping board tonnage shall be thoroughly ascertained by the shipping board, the board has an imperfect organization for so determining the responsibility of companies, and the result has been that many boats purchased from the shipping board have been turned back. Cases have arisen where purchasers of shipping board tonnage have allowed the boats to be libeled in foreign ports, thereby forcing the shipping board to protect its interests by protecting ships against libel.

Apparently, no safeguard is provided by the shipping board to prevent purchasers of boats who paid $2\frac{1}{4}$ per cent down coming before the board and pleading the general conditions, such as low freight rates, excess repair and upkeep costs, income tax, and other conditions, in securing a deferment of second payments, then taking off earnings from profitable trade as rapidly as possible, and after having become assured of a profit, permit the boat to be libeled and thus force the shipping

board to accept redelivery of the ship. In some cases, changes have been permitted in the boats which resulted in reducing the efficiency of the boat, and the shipping board not only has accepted a redelivery of the boat from its purchaser, but has paid the cost of these changes which rendered the boat undesirable. The board apparently has not properly safeguarded itself against deliberate falsification of credit information submitted to it regarding proposed purchasers of tonnage. Some sales of tonnage disadvantageous to the board have been negotiated by the claims board in the course of settlements of shipbuilding contracts.

Through a reduction of the original purchase price of tonnage, the shipping board has placed itself in position of having to meet arguments of early purchasers of tonnage that they are being penalized for having bought tonnage at the price first established by the shipping board under its sales program. These early purchasers argued that trade rates were higher at the time they purchased the tonnage, and that even at the advanced price, they could see a substantial profit. They argue now that freight rates have been reduced, and because the board is operating tonnage through managing and operating agents, they are unable to realize on the sums which they have now invested.

One of the terms which surrounded the early sales of shipping board tonnage was an initial payment of 25 per cent; this was reduced to 10 per cent with provision for a longer period of de-

ferred payments. Early purchasers of tonnage now argue that they should be given consideration in the form of a reduction of the tonnage price and an extension of their term of payment.

Apparently, the shipping board continues to allocate tonnage because conditions are such that it does not find ready sale for its tonnage, rather than seeking to remove the obstacles to sales.

Find Ship Allocation Policy Unsound

ALLOCATIONS

1 Responsibility of Companies

(a) *Favoritism in allocations and assignments*, embraces the character of boats, trade routes, etc. The allegation has been made in times past that favoritism has been made by the shipping board in the allocation or assignment of its tonnage for operation or management. Instances of such favoritism can be shown where political influence or influence through officials of the board themselves, resulted in the assignment and allocation of tonnage to companies with which the officials were or had been associated. While some companies which did not have the standing, or the financial responsibility, to insure safe and proper management and operation of shipping board boats, were able to get all the tonnage they applied for, other companies, with a long history of successful ship operation and with financial responsibility beyond question, were unable to secure the tonnage for which they had applied. Controlling, as it does, the trade routes and the character of boats, the board is able to restrict applicants for allocated tonnage, and managers and/or operators of board tonnage to conditions which make or ruin the success of the manager and/or operator of shipping board boats. It has been charged on more than one occasion that, while "shoestring companies" with insufficient financial backing, and insufficient experience in management, are able to get all the tonnage they request, which tonnage they, in many cases, are operating at a loss, reputable, experienced operators do not get tonnage allocated to them, or if they do secure tonnage, it is, in many cases, ships of an undesirable type, and they are restricted to trade routes which are unprofitable, being given no ships in the trades which are sufficiently profitable to carry the burden of loss on operation of undesirable types of boats, or boats in undesirable trades.

Offered a Temptation

(b) *Earnings or losses; interlocking ownerships* in ship chandlery, repair, water, towing, stevedoring, forwarding companies, and taking of additional percentages, creating losses which the board has to absorb, all enter into the question of desirable or unde-

sirable management or operation. The condition brought about by the managers' and operators' agreements, under which the board absorbs all losses, but shares with the manager and/or operator any net profits, is such as to give rise to interlocking ownerships and contracts. The net results, however, are bad, primarily because such a condition tends to tempt the manager and/or operator who has insufficient capital and experience to get into the ship supply or ser-

are correct, in that the shipping board, through its division of assignments and allocations, is supposed to determine the financial responsibility as well as the experience of the applicant for assigned or allocated tonnage. Unfortunately, however, owing to a lack of a credit bureau, the board does not determine in many cases these two important points with regard to applicants for tonnage.

(d) *Investigation of companies or applicants* for assigned or allocated tonnage seems to be more or less haphazard with the board. Ordinarily, aside from the work of the department of investigation, the method of ascertaining the financial responsibility of applicants for tonnage is to seek reports by the commercial reporting companies such as Dun or Bradstreet. This avenue of information became useless in the case of newly organized companies, many of which sprung up, and neither did this avenue of information assist the division of assignment and allocation in determining the experience of the applicant for tonnage. This division has no organization or method for determining what managers and/or operators are indulging in interlocking ownerships or contracts.

(e) *Remedy*.—The remedy for these conditions, obviously, lies in a properly organized credit department, together with a properly functioning department of investigation.

2. Terms and Contracts.

(a) *Earnings*.—The earnings derived from the operation of assigned and allocated tonnage ordinarily should be far above the expenses. Theoretically, the shipping board is showing a profit on earnings even with the handicaps which have been described. An actual accounting, however, of revenues and disbursements, it is believed, will show this theory to be upset. Whereas one manager and/or operator may show a profit on the earnings of tonnage operated by him, and whereas one operator may derive a good profit from his division of net profits with the shipping board on such tonnage, the net result to the board can not be considered as in that light, because the board is operating many hundreds of thousands of tons, through many agents, and the profits shown by one manager and/or operator may be, and in fact are, swallowed up

How Burdens Are Put on Operators

UNFORTUNATELY, due to laxity in determining the two all-important points of responsibility and experience with reference to the fitness of applicants to manage or operate shipping board tonnage, some companies which have not shown profits in the management and operation of shipping board tonnage have been able to secure the best type of boats and to operate in the most profitable trade routes, and yet show losses on the operation. Naturally, the burden of inefficient operation by inexperienced agents has to be passed on to the experienced operators to bear, being reflected in various ways, among which is the high percentage of gross earnings reserved by the shipping board to cover cost of upkeep, depreciation, and repair.—From report to congressional committee.

vice business and take his profits therefrom, knowing that the actual operation of the ships will show a loss, about which he has no worry, inasmuch as these losses are absorbed by the shipping board. This very condition places the legitimate operator who depends solely upon the profits derived from the actual carrying of cargoes in competition with practices which are bound to result in losses for the board; thus the legitimate operator is forced to adopt similar methods of interlocking ownerships and contracts, or else he is doomed to financial failure in the operation of board tonnage.

(c) *Bases of allocations* theoretically

in the losses brought about through improper financial organization, lack of managing and operating experience, or abuse of the agreement through interlocking ownerships and contracts, by some other agent. The results, then, can only be known when the final accounting takes place with all managers and/or operators of shipping board tonnage, and there are many who believe this final accounting will show serious losses on the gross tonnage operated.

(b) *Trade routes.*—Owing to the inflexibility of the managing and operating agreements, no operator was allowed to exercise any initiative in the selection of trade routes. Obviously there is no encouragement for the experienced operator to operate shipping board boats when he finds himself restricted wholly to the unprofitable trade routes, and it is equally obvious that there is no advantage to the shipping board in

If the shipping board is to continue the operation of an American merchant marine in competition with foreign cuts in rates, then obviously, it can do so only by the exercise of the strictest business methods, the reduction of operating expenses to the minimum, the stoppage of all leaks and sources of unnecessary expense, and by building up an organization and by maintaining such close relations with its managing and/or operating agents as to insure the most rapid "turn-around" thereby reducing losses in operation to the minimum. As has hereinbefore been set forth, the shipping board has not the organization to accomplish this, it does not maintain sufficiently close relations with its managing and/or operating agents to insure such results, and there are many who say that if present conditions and practices in the shipping board continue, it is a question of time only when the

States shipping board of assigning the same boat to one company for management and allocating it to some other company for operation, there arises in many instances a duplication of organization which in turn imposes an unnecessary expense on the operation of the boat. Cases have arisen, for instance, where the manager of a boat entering into a charter party with some shipper, under which charter party the charterer reserved the right to nominate his agents at various ports, the manager of the boat has instructed his agents to perform the necessary port offices for the boat, at the same time the charterer has nominated his agents to perform the proper port offices for the boat, and both representatives have been paid for the work of looking after the boat in port.

It is, of course, necessary that the shipping board take cognizance of such conditions and remedy them by a proper

Ships Distributed Without Regard to Previous Record of Operators

*M*ANY companies which are thoroughly equipped financially and by experience to manage and operate shipping board tonnage profitably, find themselves unable to secure tonnage for management and/or operation, even though they represent to the shipping board that they have cargoes awaiting transportation. Meanwhile, other companies are able to secure assignment and allocation of tonnage through the shipping board when such companies are not financially

able to operate the amount of tonnage assigned or allocated to them, some of these companies having a record for continuous losses on management and/or operation of shipping board boats which certainly would seem to be sufficient for the withdrawal of such tonnage from their management and/or operation. Many of the more recently organized managing and/or operating companies have not an organization sufficiently extensive to properly handle the boats allocated

to them in foreign ports, yet they are allocated more and more tonnage, while well organized companies are unable to secure tonnage. Many responsible operators declare that the treatment accorded them by the shipping board is not of the prompt nature employed in common, everyday business. The difficulties surrounding the withdrawal of tonnage from managers and/or operators who show losses seem to be such that withdrawals of tonnage are rare.—From special report.

operating ships over the profitable trade routes if inexperienced and improper operation nullifies profits which otherwise would accrue.

When the other extreme was reached under managing and operating agreement No. 3, under which the manager and/or operator was given too great liberty in the determination of what trades the tonnage operated by him should ply, the result was that the operators immediately flooded the profitable routes with tonnage, and rates went down, while routes which it is desired to develop, and which, necessarily, would be unprofitable during the early stages of their development, were neglected.

(c) *Trade rates.*—Managers and/or operators complain now that trade rates on cargoes have been reduced to such a point that it is almost impossible for any of the shipping board boats to show profits. Indeed, many operators assert that the shipping board could more profitably tie its boats up and cease operation entirely than to continue operating under the present trade rate level.

American merchant marine will prove such an expensive failure as to make it impracticable to continue it.

(d) *Tonnage, amount of, for each company.*—There seems to be no system, method, or rule by which the division of assignment and allocation of the shipping board assigns or allocates tonnage for management and operation. Indeed, "influence" seems to govern such assignments and allocations to the exclusion of proper economic consideration.

While it is true that the general operating situation is seriously disturbed by constant withdrawals from one operator and reallocation to some other operator of tonnage, there seems to be no definite system by which this is accomplished, with the result that instead of making for a betterment of operating conditions, these withdrawals in many cases aggravate unprofitable conditions.

3. Duplication of Agencies' Work.

(a) *Organization, necessity for.*—Under the present practice by the United

organization. The necessity for proper organization by the managing or operating company, particularly with regard to the selection of its foreign agents, is highly important.

Numerous files show that foreign agents representing managing and/or operating companies have made no effort whatsoever to secure return cargoes for shipping board boats, even while cargoes seeking transportation were lying in foreign docks, with the result that the profits derived from transportation of outward-bound cargoes are lost in the cost of operating the ship in ballast back to its home port.

(b) *Trade rivalry.*—Trade rivalry, while commendable, may be, and has been, carried to a point where it reacts unfavorably upon the shipping board. Many instances can be shown where at a port one operator of shipping board tonnage, holding contracts for transportation of numerous cargoes, and having but one ship available, would hold up the other cargoes, while at the same port other shipping board boats,

operated by the other companies, were accumulating per diem losses awaiting cargoes. Certainly it would seem that the establishment by the shipping board of proper reciprocal relations between its managers and/or operators would eliminate these losses.

(c) *Securing of cargoes, foreign agencies, etc.*—The securing of return cargoes at foreign ports has become such a serious question as to vitally affect the entire operation of shipping board boats. There has been a marked laxity on the part of foreign agents in securing return cargoes. It is obvious, of course, that ship operation will not be profitable if the business of carrying cargoes holds good only on one leg of the voyage. This shows the necessity for a high state of organization, supervised by the shipping board, of foreign agencies through which managing and/or operating companies operate shipping board tonnage.

Under the present practice the organization of foreign agencies is left solely in the hands of managing and/or operating companies, with the result that, in the case of managing and/or operating companies which have an insufficient or no organization of foreign agencies, and in the case of managers and/or operators who operate their own ships as well as the shipping board tonnage, the board must necessarily face losses, because in the case of the first company, its organization is not such as to guarantee return trip cargoes, while in the case of the second class of companies, preference naturally will be given to their own boats, inasmuch as the managing and/or operating company must itself absorb any losses accruing from the operation of these privately owned ships, whereas under the managing and operating agreements any losses on the shipping board operation are absorbed by the board.

(d) *Dispatch, lack of, reasons for, etc.*—Dispatch is the keynote of successful ship operation. The lack of dispatch which has characterized the operation of shipping board assigned and allocated tonnage is due to many reasons. In some cases, as at Norfolk, Va., recently, it was due to lack of bunker supplies. In other cases, it is due to lack of dry-docking facilities. In still other cases it is due to improper ship supply through lack of a proper organization in the shipping board. Again, it is due to interlocking contracts and ownerships which lead managers and/or operators to hold up boats for unnecessary repairs, in order to reap the additional revenue from these sources. In still other instances it is due to lack of sufficient operating capital. In other cases it is due to improper accounting methods. In still other cases it is due to inexperience on the part of the managing and/or op-

erating company. Again, it is due to the preference given by some managing and/or operating companies to their own ships in discrimination against tonnage operated by them for the shipping board. In many instances it is due to improper organization of foreign agencies.

Whatever the reason in any specific instance may be for the lack of dispatch, the loss to the shipping board is just as great and just as serious as though the same reasons were responsible for all delay in dispatch. One of the potent reasons, it is said, was the rigidity of the

Fails To Enlist Aid of Private Firms

*T*HERE has been little if any attempt on the part of the shipping board to confer with contractors who serve or supply United States shipping board ships from the standpoint of these service and supply men being primarily part owners of the American merchant marine, secondarily in being interested in seeing the American merchant marine prosper in order that they may continue to serve or supply ships. The relation between managing and/or operating agents and the contractors who serve or supply ships has not been a close one in many instances, because of the fact that responsibility for the service or supply of these ships is so divided between managing and/or operating agents and the various departments of the shipping board as to make neither the agent nor the departments of the board wholly responsible for the results obtained. Until this is remedied, serious losses are bound to continue.—From report to congressional committee.

managing and operating agreements, which restricted solely to the board the right to transfer a shipping board boat from one trade to another, and the lack of dispatch in the central organization at Washington in providing for such change of trade route upon request of the managing and/or operating company. It is a common complaint of managers and/or operators that they are unable to get a business-like promptness in the disposition of their requests governing the operation of shipping board tonnage from the central organization.

Taken in its entirety, lack of dispatch due to any of the reasons assigned in the foregoing enters very largely into the success or failure of the American merchant marine. In fact, it is one of

three governing factors, the other two being experience on the part of the managing and/or operating company in the operation of vessels, and the reduction to a minimum of the cost of upkeep and operation.

It may be noted here that the current repairs to vessels which, in foreign practice, and under private ownership, are performed by members of the crew during the voyage and while the ships are in port, are, on shipping board boats, performed in port by drydocking and repair companies. This is true, it is said, of 90 per cent of the normal repairs done by foreign crews. A common complaint of managers and/or operators is that under the present conditions the crews go ashore the moment their ship touches dock and do not do anything with regard to the loading or repair of the ship during her stay in port. Managers and/or operators also complain that they are unable to get the crews to do anything other than merely navigate the ship while at sea.

(c) *Remedy.*—The remedy, of course, lies first in proper organization, supervised by the shipping board; second, in the establishment of reciprocal relations between the various managing and/or operating agents of the shipping board to insure the rapid "turn-around" of all boats; third, the proper steps to secure cargoes through foreign agencies for the homeward-bound leg of the voyage; fourth, the elimination of all reasons for lack of dispatch.

4. Supervision

(a) *By director of operations, lack of.*—The lack of supervision by the director of operations of the shipping board and his organization is such as to leave almost entirely out of the hands of the board the operation of its tonnage and the remedies for many of the abuses which underlie the losses in operation. It has developed that in many cases of masters and stewards placed on deferred lists, that is, removed from active service for cause, these same masters or stewards have been found aboard other shipping board ships in the employ of other managers and/or operators, and came to notice only when they committed some new act of carelessness or dishonesty. The division of operations is unable, by reason of the managing and operating agreements, to deal directly with contractors and with ship supply agencies. If the division of operations is to function properly, according to the theory upon which its existence is based, it must be composed of men who have ship operating experience, and a wide and varied business experience in addition thereto. Such does not seem to be the case with the organization of the division of operations as built up at the present time.

(b) *By port agents, lack of.*—The same obstacles lie also in the way of supervision of operation of shipping board tonnage by the port representatives of the division of operations. Their functions are not well defined, and the authority of these port agents is not so well established as to be of any real worth to the shipping board.

Not only is the compensation as now paid by the shipping board to its port agents insufficient to attract men of ability, but the conditions are such that even when men of ability are secured for these port positions, they seldom remain long with the shipping board before they are taken at higher salaries by managing and/or operating companies, so that the shipping board is left in position of being the preparatory school or clearing house for officials.

(c) *By foreign agents, lack of.*—The lack of supervision of operation by foreign agents, particularly with regard to promptly securing cargoes for the return voyage of the boats, is one of the crying evils of the present practice. Care should be exercised by the shipping board that its managers and/or operators have foreign agents whose motives would be to help make the American merchant marine a success. The same condition obtains with regard to the service and supply of shipping board vessels abroad. It is common knowledge in seagoing circles that shipping board ships are grossly overcharged by foreign service and supply men, not only from the standpoint of common dishonesty but from the further standpoint of a desire on the part of these foreign service and supply men to see the American merchant marine fail.

(d) *Relation of United States Shipping Board to contractors and agents under agreements.*—The relation of the shipping board to contractors under the managing and operating agreements 1, 2, and 3, is an indirect relation, in so far as the necessity for repairs to the ships

Buys Back Materials at a Loss

THE sale of materials by United States shipping board supply and sales division at a price so low as to net the shipping board not more than 13½ per cent of the original cost, although in many lines this material is higher now than it was at the time of its original purchase by the shipping board during the war, leads to the practice of repair companies buying up this material from the shipping board at these reduced prices and reselling the same material to the board for its repairs to its ships at even a higher than prevailing market price. Thus a double loss is entailed for the shipping board, while an excessive profit is secured by the repair company. Again, this material is frequently passed through two or three different agents, each of whom takes a substantial profit, and it then finds its way back into shipping board ships.—From report to congressional committee.

is decided by the managing and/or operating agent, the survey and specifications are drawn up by the insurance and construction and repair departments of the shipping board, the work is inspected and time is kept by the auditing department, and the work finally approved by both these departments, and the bills paid out of the revenues held in trust by the managing and/or operating agents for account of the board. Under the Martin contract this will be done away with and the necessity for repairs, the surveying and drawing of specifications, the assignment of the work, the inspection and approval of the bills for pay-

ment, will all be decided upon and performed by the Martin organization, which is not a part of the shipping board, and the bills will be paid for account of the board by the managing and/or operating agents.

(e) *Remedy.*—The remedy for the conditions as set forth under the subject of "SUPERVISION," obviously, is to so amend the managing and/or operating agreements as to give to the director of operations a closer and more direct control of the operation of shipping board boats, and to reflect this control through the port representatives of the division of operations. The personnel of the division of operations obviously would have to embrace men of ship operating and other business experience sufficient to qualify them to handle a business of such magnitude as the operation of shipping board ships comprises. Greater compensation and a closer co-operation between port representatives and the central office of the division of operations are also necessary. Responsibility for results in ship service will have to be more clearly defined and placed upon either the managing and/or operating agents or the departments of the shipping board.

Although the supply and sales department theoretically is supposed to function as its name would imply, it has really been a sales organization purely, and has not succeeded in that line of endeavor. Although it has hundreds of thousands of dollars worth of supplies which could easily be reallocated to the repair and supply of shipping board ships, these supplies are netting approximately 13½ per cent of the original cost and are being purchased by the service and supply men who serve and supply shipping board ships and sold back to the shipping board at 100 cents on the dollar.

Pile Up Mistakes in Operating Ships

1. Charters

(a) *Bare-boat charters.*—In opposition to the present methods of the shipping board in assigning and in allocating for management and operation so much tonnage, there are those who argue that the bare-boat charter basis is the only proper foundation upon which the shipping board can hope to successfully operate it as government owned and operated tonnage. It is argued further by the proponents of the bare-boat charter that the heavy upkeep and repair expense is thus eliminated by the shipping board, that the operator is placed in position of exercising the same care

that any private operator exercises over the operation of his tonnage; with the result that interlocking ownerships and contracts, and agency fees, which are sought by some operators who have no intention, apparently, of either owning or operating tonnage for revenues from cargo carrying, would be stopped; and at the same time would demonstrate to the shipping board those operators who possess the experience, or energy to acquire sufficient experience, to become successful operators in a privately owned American merchant marine. Under the bare-boat basis of charter much of the shipping board's overhead would be

avoided, and many of the evils hereinbefore set forth would be eliminated.

(b) *Time charter.*—The time charter is so closely allied to the present method of allocation as to offer but little advantage over the present practice of the shipping board.

(c) *Charter and purchase plan.*—The shipping board for a time adopted a method of selling its tonnage on a charter and purchase plan, which called for a 2½ per cent payment of the purchase price of the boat down, and certain charter conditions to protect the shipping board. This method, although it was tested, did not prove successful.

2. Rates.

(a) *Competition.*—The question of rates, of course, is a fundamental one in the success or failure of the American merchant marine. Naturally, foreign competitors took advantage of the situation by cutting rates. The shipping board thus faced the alternative of also reducing its rates, in a rate war which would have cost millions, or in withdrawing its tonnage and creating a shortage of tonnage, automatically increasing rates through the law of supply and demand. The latter course was adopted after rates had suffered a 50 per cent decrease.

Upon the withdrawal of its tonnage, which, of course, was a source of serious loss to the shipping board in rendering inactive its ships, the rates slowly rose to a somewhat higher level, and by the cautious introduction of its tonnage back into operation, the shipping board was enabled, to some extent, to re-enter the field without further seriously disturbing the rates, which now seem to be temporarily stabilized at their present level.

Apparently the foreign competitor, by means of keeping in touch with the amount of tonnage the shipping board was putting into operation, was able to cut rates 25 to 50 cents a ton and avail himself not only of the greater amount of tonnage, but also to take advantage of the slowly increasing rates. The lack of scientific business practice in the shipping board, plus the inertia of the board organization, made it impossible for these conditions to be met as promptly under shipping board practice as they could and would have been met under private practice. The net result of this condition was that the shipping board not only suffered the losses incident to tying up its tonnage for a time, but it failed to reap any marked benefits upon the re-introduction of its ton-

nage into operation, because it did not meet the strategy of the foreign competitor. It is asserted by many that the shipping board is in great need of a competent traffic bureau.

(b) *Supply and demand of tonnage.*—Rates can be manipulated by taking advantage of the supply of and demand for tonnage, and it is seriously to be questioned whether or not this offers the ultimate solution of the problem, so long as the foreign competitor stays

the transoceanic trade. Whichever solution may be the proper one, it seems to be established that the shipping board has not met the condition.

(c) *Rate bureau.*—The shipping board maintains a bureau which is supposed to function as a traffic bureau, but apparently does not do so.

3. Trade routes.

(a) *Development of trade routes.*—Under old practice in the shipping board, development of trade routes was sought by the arbitrary assignment to certain operators of tonnage which was to be used only in certain trade. Certain routes were laid out to be developed, and there was no departure from the rule that the tonnage allocated to this trade must continue in that trade. This resulted, in many instances, in operators being unable to make any profit because they had tonnage allocated entirely to trade routes which, being in early stages of development, were naturally unprofitable. No provision was made to divide the burden of developing such trade routes among several operators, allowing them also to participate in profitable trades, in order to balance by profits on profitable routes the losses due to development of unprofitable routes. It was this condition which resulted in the drastic change under managing and operating agreement No. 3, which caused the shipping board to swing to the other extreme and allow managers and/or operators too much discretion in the selection of trade routes for the tonnage they operated. Lack of balance as to net earnings of the several routes is one of the serious handicaps to the proper development of the American merchant marine.

(b) *Coastwise routes.*—For some reason but a small percentage of shipping board tonnage has been allocated to coastwise trade.

Bad Business Practice Causes Mistakes

THE great majority of these losses come not through criminal practice but through bad business practice. Yet the losses are just as great and just as serious as though they were the result of criminal practice; even more so, since they cannot be investigated and stopped as easily as criminal practices could be handled.—From report to congressional committee.

a few cents under the rate and gets a large portion of the tonnage. There are many who assert that it would have been better for the shipping board to have met squarely a rate war and to have paid the losses incident thereto all at once, rather than to have deferred such losses from day to day and to have paid them in installments by tying up its ships. Others assert this was not the proper plan, but that some of the tonnage should have been retired temporarily and other tonnage allowed to operate at the prevailing rates. Others assert that the coastwise trade should have been developed with shipping board tonnage to make up for deficiencies in

Heavy Money Losses Met in Supplies

1. Service.

(a) *The service of purchase and supply under managers and operators' agreements 1-2-3 and (contemplated) 4* is left almost entirely in the hands of masters, chief engineers and stewards. Under one of these agreements the shipping board is supposed to furnish the service, yet, as a normal part of operations, the managing and/or operating agent should perform this service. In the agreements there is nothing laid down as to how this service shall be rendered, as to what basis of prices shall be secured, or as to what shall be done if lowest wholesale prices are not secured. The result is, conservative-

ly estimated, an overcharge on the millions of dollars worth of supplies purchased and being purchased for shipping board ships, amounting to 40 to 50 per cent. This service of purchase really should be performed by United States shipping board with a properly organized staff of purchasing agents. Otherwise, proper provision should be made in the managing and operating agreements to require the manager and/or operator to perform the service of purchase and supply under some system which will insure United States shipping board the lowest wholesale prices, a proper quality of goods, proper inspection, inventory and rationing. This

phase of operation, one of the big sources of expense, is, under present practice, nobody's concern, and everybody's business, so to speak.

(b) *Wholesale rates, instead of the rates secured by United States Shipping Board* under present practice, should be the rule. Many wholesale firms in the various ports would participate in shipping board business if they did not have to pay gratuities to secure it. It is not uncommon for ship chandlers supplying shipping board ships, under present practice, to carry less than \$25,000 in stock, yet handle half a million dollars' worth of orders annually. They secure orders from managing and/or

operating agents through the stewards, go to the wholesale houses, purchase the bulk of the order at the same prices at which the shipping board would secure the supplies, have it delivered to ship, and take off a broker's profit of, usually, 25 to 40 per cent, and add still an additional percentage to cover free automobiles, gifts of gratuities, payments of commissions, etc., to stewards, or masters, or both. Wholesalers in any port of consequence in the United States are ready to give such rates to United States shipping board if the methods of ordering, delivery, etc., are reformed, and gratuities and entertainment eliminated.

(c) *Incompetent stewards* are numerous, and are in most cases entrusted with the expenditure of these enormous sums. Under present practice there is little if any effort made to keep trace of stewards who prove unworthy of their trust. Many of the stewards who are, or have been, in the service of those companies handling shipping board boats are foreigners who have no interest or pride in the upbuilding of the American merchant marine, but who, on the contrary, come in the service of the shipping board for the "big money," and the opportunities for gratuities and commissions, which are said among seamen to be much easier under our practice than under foreign practice or private ownership.

Purchases Are Not Checked

(d) *Improper deliveries* enter largely into the excessive cost of supplies furnished under present practice to shipping board ships.

(e) *Improper checking, inspecting, and inventory* add greatly to the expense and losses by the United States shipping board. In private practice not only are supplies checked closely when they arrive shipboard, but they are inspected closely as to quality, as well as quantity. Under the present practice in handling shipping board ships there is little, if any, inspection, except by the stewards who make the purchases.

(f) *Improper invoicing* is another evil which costs the shipping board huge sums. Instead of the stores being invoiced by brand, quality, weight, number of containers to the case, price, etc., most of the invoices are audited and passed with no definite description of the supplies delivered.

(g) *Improper auditing* under these conditions becomes costly. No auditor can properly audit an invoice for supplies unless the description is such as to give him definite information upon which to base a judgment as to whether the price is reasonable.

(h) *The payment of commissions and gifts of gratuities* is probably one of the

most notorious and common evils now surrounding the operations of United States shipping board vessels. "The bit" or "commission" has so long been a deep-water practice under private management and ownership that it has become an institution among seamen. To their sense of morals it has ceased to be dishonest, and instead, by long custom, has become proper and right. The usual "commission" demanded by stewards who seek gratuities is 5 per cent, although of later days it has risen to

seems to be that "Uncle Sam pays the bill," so apparently nobody takes the trouble to watch the situation closely.

(i) *The losses to United States Shipping Board from these sources* are stupendous—amounting, probably, to 40 per cent, possibly 50 per cent, of the total cost of ships' supplies. Not only are these causes of losses easily to be remedied to a great degree, but if they are not curbed they will seriously menace the future of the American merchant marine.

(j) *Interlocking contracts*, such as are held by many managing and/or operating companies in subsidiary companies which furnish supplies or service to shipping board ships are not only sources of great profit to these managing and/or operating companies on the one hand, but are a means of paralyzing what otherwise would be a natural inclination on the part of managers and/or operators to protect the interests of the shipping board, since, at least in point of division of profits, the interests of the managers and/or operators are closely linked with the interests of the shipping board. But where these managing and/or operating companies hold pecuniary interest in subsidiary companies such as ship chandlery, stevedoring, towing, fueling, watering, repair, painting, scaling or forwarding companies, the managing and/or operating company can, many times, make a greater amount of revenue from supplying or serving the ships operated by them than they can from the actual operation of carrying cargoes, and dividing with the shipping board the net profits.

2. Galley Supplies.

(a) *Excess profits* in galley supplies, such as foods, are easily reaped by ship chandlery companies under the laxity of the present system of purchasing, delivery, inspection, invoicing, and auditing.

(b) *Short deliveries*, so easily accomplished by reason of the laxity or total absence of any proper inspection and checking system, result not only in an initial loss to the shipping board in the purchase of its ship supplies, but cases are not infrequent wherein a ship's crew runs out of supplies at sea, although the boat has been overstocked, according to the requisitions, before sailing. The goods are short delivered.

(c) *Certification of invoices in blank by stewards and captains* is a not uncommon practice, and the comptroller's department is now in possession of specimens of these invoices receipted and approved in blank by stewards and masters in the employ of the shipping board. How easily the ship chandler

Permit Extravagance in Repair Work

*I*N the survey and letting of repair contracts, the present practice, as has been shown, is a source of serious loss to the shipping board and a menace to the prosperity of the American merchant marine. Prompt and proper surveys are essential to successful operation of ships. There is no reason why, in a great majority of cases, the initial survey cannot be made sufficiently complete to eliminate the necessity for supplemental contracts.

The methods of bidders to secure excessive profits, as adopted by many under present and past practice, could easily be stopped. There are to be found in every port in the United States men who are said to be willing to invest their capital in repair plants if they are assured the work on shipping board ships will be awarded under open competition. These men would be willing to accept reasonable profits for their work, and competition is the one method by which improper practices and excess profits may be controlled, in lieu at present of any laws to cover the condition.—From report to congressional committee.

10 per cent. The same amount is demanded in many cases by masters. This is true of all supplies and services to ships such as galley, deck, engine room, fuel, and water. While the practice under private ownership was not so gross, because it was more closely watched, and each company has fewer ships, and wages and salaries paid ships' crews and officers are lower, when the number of ships being operated by managing and/or operating companies for account of the shipping board is considered, plus the wages and salaries now being paid crews and officers, plus the overstocking of the ships, plus the overcharges and excess profits being reaped, the question of these gratuities becomes one of vital importance. But, the general attitude

can short deliver, overcharge, or even falsify these invoices is obvious under these practices.

(d) *Overstocking* of shipping board ships, an evil which has been constant and expensive, is due to three causes: One, the lack of instruction or knowledge of the steward as to the proper diet per man day to be provided; two, the desire to get greater "commissions"; three, to provide surplus supplies which can be sold at high prices at foreign or domestic ports. This practice is difficult in the navy, due to a rationing system well worked out, a proper checking and inspection system, plus an inventory system which shows at all times very closely how much food supply each ship has. None of these systems prevails under shipping board practice. A rationing system would, of course, largely prevent over-purchasing. Checking would prevent short deliveries. Inspection would keep up the quality of supplies purchased. An inventory would show how much was needed to complete stores to bring them up to the man-day-ration chart requirements. Proper invoicing would give shipping board auditors a proper basis from which to judge prices charged.

3. Deck Supplies.

(a) *Improper purchasing methods* result in as great losses in this line of ship supply as in galley supplies. The purchase of these supplies is usually left in the hands of the master or deck officer, and frequently is performed by the steward. The same conditions of middlemen's profits, brokers' profits, and payment of gratuities prevail as in the case of galley supplies.

(b) *Short deliveries* are common in this line of supply, as in galley supplies. The same conditions surround the two operations of supply, hence the same evils are common to both.

(c) *Inferior goods* are foisted upon

the shipping board in this line of supply, due to the same laxity and improper practice which makes the same thing possible in galley supply.

(d) *Overstocking* is common in this line of supply, largely because ready sale at good prices is to be found for this class of supplies.

(e) *Lack of proper inspection, checking and inventory* are prominent contributory causes of overstocking, thefts, short deliveries, and delivery of inferior supplies in this line, as in galley supplies.

(f) *Lack of co-operation by the supply and sales department* of the shipping board results in many supplies being bought at new prices when the shipping board is selling at other points the same supplies at 13½ per cent on the dollar.

(g) *The remedy* would seem to be provision for proper inspection, checking, inventory, and an arrangement whereby these ships could be outfitted, as far as possible, from the stores now in possession of the supply and sales department.

4. Engine-room Supplies.

(a) *Same as deck supplies.*—The same conditions surround the purchase of engine-room supplies as in the other lines of supplies, and the same evils exist.

5. Fuel.

(a) *Same as deck and engine-room supplies.*—In addition to which, however, there is a greater opportunity for losses to the shipping board, owing to the generous charts worked out in shipping board practice for fuel consumption. It is not at all uncommon for the engineer to have left unconsumed fuel from a voyage amounting to from 50 tons upward, or, in case of oil-burning boats, many barrels of oil. Under the fuel-consumption charts a good margin of consumption is allowed, and there is,

of course, no way for the chart to take into account windage or other influences, such as favorable currents, etc. The result is in many voyages, with a favorable wind on both legs of the voyage, the ship will not nearly consume her quota of fuel allowed by the consumption charts. A remainder in the bunkers results, and, owing to improper inventory, little, if any, account of this is taken. A common result of this is for the engineer, many times in conjunction with the master, to receipt for more fuel than he actually receives from the bunkering companies (to the exact amount of the tonnage he has in his bunkers unconsumed), and then get a rebate from the bunkering companies on this tonnage, sometimes in a division with the bunkering company and the master, sometimes in a division only between the chief engineer and the master, and occasionally the chief engineer taking the entire amount.

(b) *Excess profits* to vendors, as well as unfair burdens of cost to the shipping board, are common in the supply of fuel. Many bunkering companies charge to the shipping board insurance on the coal in transit, which actually is not carried, and certainly is a part of the cost of transit. High freight rates, high loading charges, etc., all are passed on to the shipping board with consequent excess profit to the fuel company. Short deliveries, owing to improper checking, are common.

(c) *Theft of unconsumed fuel* is difficult of detection without a system of surveillance and investigation such as the department of investigation constituted.

(d) *Improper chart averages of consumption* should be checked up and probably a closer working out of these charts would to a degree remedy this evil, which costs the shipping board scores of thousands of dollars annually under the practice which it permits today.

Report Criticizes Payments Made in Disposing of Wooden Hulls

AMONG other contracts made by the shipping board which have been severely criticized is the George F. Rogers hull-removal contract. This contract covers generally all of the hulls in an unfinished state of construction at the time of the armistice, or rather at the time the contract with Rogers was signed. Under the terms of this contract, Rogers is to remove all of these hulls from the building ways, or is to secure from the builders of the hulls and the owners of the land upon which the hulls and ways rest a release from further liability. Also the shipping

board saw fit to make a contract with Rogers to pay him \$5000 per hull for each hull thus handled by him. The result has been that in many cases the shipping board has paid an additional \$5000 per hull to have Rogers sell the hull or give it away, in many cases the cost of the hull representing several thousand dollars. Rogers has found so little difficulty in selling these hulls to the builders or others at a very fair price, which revenues, under his contract, revert to Rogers, in addition to which he collected from the Emergency Fleet corporation \$5000 per hull fee, and in so few

cases has Rogers had to remove the hulls from the ways at all that the question has arisen in the minds of a great many persons as to why, since these hulls were so easily disposed of at a return, the supply and sales department of the Fleet corporation could not have disposed of the hulls in the same manner in which Rogers did, conserving to the Emergency Fleet corporation the \$5000 per hull fee paid Rogers, and, in addition to this, reaping whatever monetary returns have accrued from the sale of these hulls.—From report to congressional committee.

Ship May Finish Trip Weeks Before Accounts Are Properly Audited

A SHIP starting on a voyage will sail through a district under jurisdiction of one group of shipping board auditors and other officials. That ship will take on supplies or will require service. The accounting of her expense will, after a period of weeks, reach the district office from various ports. Meantime the ship has sailed through other districts controlled by various other auditors and shipping board officials, and her expenses incurred in those districts will be accounted by those district officials without any knowledge of any expense she incurred in some other ports. These accounts after

weeks will reach that district office. Meantime the ship has sailed for a foreign port. There she incurs still more expense. The officials at foreign ports have no knowledge of the expenses incurred by the ship at American ports. These accounts are months in reaching the home office. Finally, many weeks after the ship has completed her round trip voyage, and after her expenses in each district or at each port have been paid, the managing and/or operating company, which has paid out of the funds of the shipping board, held in trust by the managing and/or operating company, all of these bills, and after master or

other officers have left the service of the ship and the managing and/or operating company, it is discovered that the ship was heavily overstocked with supplies, or had required entirely too much repair, or the prices had been excessive.

Due to lapse of time it is impossible in most cases to get the testimony of the officers or crew to determine what the actual causes of this expense were, and finally the managing and/or operating company takes refuge from censure behind the plea that the bills were approved by the district shipping board officials.—From report to congressional committee.

6. Water

(a) *Same as deck, engine room, and fuel supplies*, so far as short delivery, graft, etc., are concerned.

(b) *Unfair differentials* are, in many cases, found to exist, as in Jacksonville, Fla., for instance, where the city rate to shipping board ships is almost 50 per cent higher than the city rate to manufacturers using less water than the shipping board uses in its ships.

(c) *Excess profits* are common in the water supply business. Profits as high as 500 per cent are found to exist, in companies which, it seems probable, managing and/or operating agents of the shipping board are interested. These excess profits arise from excess charges for the service, short delivery, and falsification of tank capacity.

(d) *Middlemen's profits* are in many

instances taken off, as in the case of the ship chandler who will handle the water supply and will, simply by process of taking the order for the water and collecting the bill, and telephoning the orders to the water supply company, which company delivers the water direct to the ships at the same price to the ship chandler that he would provide the same service to the shipping board. The chandler adds 10 to 15 per cent.

7. Thefts.

(a) *Prevalence of thefts* is so great as to demand immediate attention. According to the testimony of masters, mates, stewards, supercargoes, even seamen, the lack of proper checking, inspection, and inventory has made the ease of theft of supplies from shipping board boats the talk of the world in sea circles. In both domestic and for-

eign ports these thefts run into the thousands per month and little check is being applied to the condition by the shipping board.

(b) *Prosecution* of these thefts is difficult in many instances because, according to shipping board legal advisers, there are few laws to cover them, and the technicalities are so numerous that it is well-nigh impossible to convict masters, mates, engineers, or stewards who are known to practice theft. Everything from ships' clocks to brass, copper, oil, gasoline, fuel, food supplies, even to office equipment, is sold at various ports, and the cases are so numerous as to stamp this practice as a menace.

(c) *The remedy*, of course, lies in regulating the buying, and, more importantly, in proper inventory to check up the unconsumed supplies and thus regulate the unexplained consumption.

Mistakes Made in Operating Agreements

1. Evils of

(a) *Lack of protection for the United States Shipping Board* under managers' and operators' agreements 1-2-3 are marked, particularly as regards the safeguards placed around the handling of shipping board funds collected by and remaining for long periods in the hands of managing and/or operating agents.

(b) *Lack of supervision by departments of the United States Shipping Board*, due to lack of investigating and intelligence facilities, lack of proper protective provisions in the agreements, lack of competent men in many cases, and the influence of managing and/or operating agents, is serious and makes for leaving such important duties as the service of purchase and supply indirectly in the

hands of the managers and/or operators, and directly in the hands of men who draw the lowest salaries and have the least sense of responsibility in the matter.

(c) *The danger of losses* arising under the conditions set forth are great. Only the closest supervision by departments of governmental affairs insures against losses.

(d) *Losses in operation are encouraged by interlocking contracts* between managing and/or operating companies owning stock in the subsidiary supply or service companies.

(e) *Lack of proper supervision of revenues and expenditures* makes possible serious losses to the shipping board without a knowledge of them in time to prevent them. Indeed, prevention of these losses under present

practice is almost impossible with present methods of accounting. Under a proper system of ship supply, inspecting, inventory, checking, and transmission of this information from district to district, or port to port, following the ship's itinerary, this could be prevented.

5. Accounting and auditing.

(a) *Loss of time* in auditing and approving voyage accounts and other proper expenditures many times works a hardship on the managing and/or operating agent and forces him to secure loans from banks or service or supply companies, thus placing him at a disadvantage. If invoices containing items which, in the judgment of the agency auditors are questionable, were passed for the ex-

penditure of such items as are found proper, and only the questionable items held up for further investigation, much of this trouble would be eliminated. In some cases bills amounting to thousands of dollars have been held up, and reimbursement of the entire expenditure denied the manager and/or operator for months because some items amounting to a small fraction of the whole seemed improper or were not fully supported.

(b) *Accumulation of United States Shipping Board revenues unaccounted for in hands of operators and/or managers* is bad practice, in that in some cases one manager and/or operator will be holding up shipping board ships for lack of funds to operate, while another company in the same port will have more money in its trust fund than it knows what to do with. These funds, under present practice, must from time to time be sent to the district office, and while they are in transit to the district office and back again to the port from which they come, to relieve an emergency need of some other company, a ship operated by the latter company may have lost two or three days in a domestic or foreign port.

(c) *Losses on voyages* are unavoidable at times, but where a managing and/or operating company shows a continuous loss in operation of shipping board ships something is wrong with his management and/or operation, and his contract should be canceled. Yet there are companies managing and operating shipping board vessels which have for months, from the very beginning of their operation in fact, shown such losses, yet they are given more tonnage or are allowed to operate the original tonnage allocated to them. The remedy lies, it would seem, in a closer co-operation between the comptroller's department and the operating department, particularly the allocation division.

Under the shipping board's new regulations, government vessels are now permitted to take part cargoes from British Columbia ports. Heretofore, this privilege was denied operators. Scarcity of freight, however, resulted in a change of regulations under which American vessels may compete with foreign lines for oriental offerings.

A cargo of 5041 tons of molasses in bulk recently was discharged at Portland by the tank steamer CITY OF RENO. The product came from the Hawaiian islands. It was handled expeditiously in the big tanker's holds.

Government Fails To Build Up Loyalty

THE natural tendency of men and women is to be less careful of government funds than they are of their personal funds. Another point which arises is the fact that many persons who would be strictly honest in their personal dealings with other persons seem to view the "government" as an abstract something at Washington, of which they themselves are not a part, and they seem to consider that to overcharge this government is not an offense similar to that of overcharging their friends and personal patrons.

Many a man who would go hungry to pay a debt of honor feels a thrill of satisfaction when a street car conductor fails to take up his fare. He does not feel he is cheating any one. He is merely "beating a corporation." While, of course, this state of mind can not be proved except by opinion, it is an important factor. For that reason, it is necessary to minimize the result of this feeling of detachment on the part of so many persons by the departments of the shipping board giving the closest supervision and having the most intimate knowledge of the affairs in the field, yet the departments admittedly do not do this.

Another grave danger is the lack of method employed by the shipping board in determining the responsibility of companies. Under present practice of allowing operating companies to retain for long periods immense sums of shipping board moneys, collected in prepaid freights, etc., there is grave danger that the failure of some of these companies would result in loss of such shipping board moneys and recovery be difficult, if possible at all.

Another condition making for loss to the shipping board is the lack of co-operation between the central organization of the shipping board and the operators in handling strikes and other disturbances at foreign ports. As in case of the Jacksonville Shipping Corp., losses on the operation of shipping board ships may go on for an indefinite period through some labor disturbance at a port like Habana before the shipping board acts.—From report to congressional committee.

U. S. Wins First Race

The recent international fishing smack race caused great excitement in north Atlantic fishing ports. Capt. Marty Welch, Gloucester, Mass., sailing the *ESPERANTO*, also of Gloucester, won two out of three in closely contested races at Halifax, N. S., against the *DELAWARE* of Lunenburg, N. S., sailed by Captain Himmelman. The race was for a cup offered by W. H. Dennis of Halifax which is to be contested for each year in an international fisherman's race. According to the opinion of north Atlantic fishermen it was the greatest race ever sailed in the north Atlantic. It was a plucky, hard fought race, full of exciting moments when the dangers of rocky ledges were risked to gain position or when on turning a buoy the vessels were so close that the bowsprit of one overhung the stern of the other. After the race, Captain Welch and his crew were banqueted by representatives of the dominion government and of the city of Halifax. The city of Gloucester which furnished the sturdy vessel and clever captain which captured the cup for America has declared a holiday in celebration of the event.

William A. Fairbanks, director of the Massachusetts commission on foreign and domestic commerce, in contradiction of the report of the shipping board, says that Boston occupies third place among the seaports of the United States. The shipping board figures indicate that Boston occupies tenth place in total overseas tonnage, twelfth place in export tonnage and seventh place in import tonnage. Mr. Fairbanks maintains that the port of Boston is only surpassed by New York and New Orleans in the value of her total overseas trade and by New York only in imports.

Commercial relations with Vladivostok, which were terminated several years ago because of unsettled conditions in Russia, are being resumed on a limited scale. The steamer *Cross Keys* has arrived at Seattle with 3500 tons of Siberian cargo, the first from Vladivostok in many months. Other freight is now offering from the Siberian gateway and it is expected that the former active trade with Vladivostok will gradually come back.

Beginning the new service between Puget Sound and New Orleans, the steamer *IRIS* has sailed from Seattle for gulf ports. The *IRIS* was formerly a shipping board training ship. Steamship connections with the gulf have been long desired by Seattle shippers and a permanent trade is expected to result.

Study Freeboard Rules For Lakes

Committee Has Prepared Data on Bulkhead Subdivision of Lake Vessels—Requests Assistance from All Familiar with Accidents

THE Great Lakes subcommittee on bulkheads and freeboard is making favorable progress in its investigation of conditions affecting lake shipping, particularly those having any bearing upon the freeboard or bulkhead subdivision of lake vessels.

At New York, on Oct. 27, a meeting of the United States government committee on bulkheads and freeboard was held, presided over by Rear Admiral D. W. Taylor, chairman. This was attended by the members of the subcommittees for the Atlantic, Gulf, and Pacific coasts and the Great Lakes. At this meeting, an interim report was presented by each of these subcommittees, showing the work that has been accomplished to date.

The first part of the lake report dealt principally with the strength of lake vessels and their reserve buoyancy, as compared with seagoing ships. The second section presented a list of vessels lost on the lakes, from all causes, during the past 15 years, and statistics showing the percentage of the fleet lost, for comparison with the losses in seagoing vessels, over a similar period. The committee is continuing its investigation along these lines, to cover a period of 20 years, and the complete data will be published in the final report of the committee.

In connection with the data on the strength of lake ships, it is of great importance that observations on the length and height of storm waves be taken by the masters of vessels, as the opportunity occurs, in compliance with the request presented in the October issue of the MARINE REVIEW. Since that time there has been little bad weather, but the committee has received a few communications from masters, with wave data that are both valuable and interesting. It is hoped that, before the end of the season, sufficient information of this character will be received to enable the committee to arrive at proper strength factors for lake vessels.

At the meeting of the general committee, it was decided that each subcommittee should present a further report at the next meeting, to be held in New York, Jan. 14 and 15, 1921.

The Great Lakes subcommittee is preparing to analyze the losses among lake vessels, insofar as particulars of disasters are available. This inquiry will cover all features relating to the

loading and structural strength of the vessels, and which would have any influence upon the final decision regarding the load line. The committee is endeavoring to secure the facts relating to vessels that have foundered, from those in a position to know and has issued to vessel masters and owners, a letter and questionnaire requesting such information.

In order to give this matter the widest publicity, the committee has asked that a copy of the letter, which follows, be published in MARINE REVIEW.

Steel Lake Vessels Lost By Foundering

Name of vessel	Lake where foundered	Year
Str. John Owen (comp.)	Superior	1919
Str. S. R. Kirby (comp.)	Superior	1916
Str. James B. Colgate	Erie	1916
Str. Merida	Erie	1916
Str. Onoko (Iron)	Superior	1915
Str. Benjamin Noble	Superior	1914
Str. Isaac M. Scott	Huron	1913
Str. Wexford	Huron	1913
Str. Regina	Huron	1913
Str. Argus	Huron	1913
Str. Hydus	Huron	1913
Str. James Carruthers	Huron	1913
Str. John A. McGean	Huron	1913
Str. Lislefield	Superior	1913
Str. Charles S. Price	Huron	1913
Str. H. B. Smith	Superior	1913
C. F. Pere Marquette 18	Michigan	1910
Str. Aurania	Superior	1909
Str. Ottawa	Superior	1909
Str. W. C. Richardson	Erie	1909
C. F. Marquette & Bessemer No. 2	Erie	1909
Str. D. M. Clemson	Superior	1908
Str. Cyprus	Superior	1907
Str. Ira H. Owen	Superior	1905
Str. Bannockburn	Superior	1902
Str. Hudson	Superior	1901

together with a list of steel vessels that have foundered in storms. Information concerning these disasters will be of the greatest value, and it is hoped that all who are able to assist in supplying the necessary details will do so. The address of the Great Lakes subcommittee is 870 Kirby building, Cleveland.

The letter follows:

As you are probably aware, the Great Lakes subcommittee has been appointed to advise the government, before the next session of congress, as to the necessity of applying loadline regulations to lake vessels. A full investigation of this subject is being proceeded with, as rapidly as possible, so that the proper freeboard for lake vessels of the various types may be determined without delay.

In conducting this investiga-

tion, the committee is desirous of securing from masters and crews, owners and operators, practical information on all matters having any bearing upon the subject of freeboard, and such as will enable the committee to draw correct conclusions as to the effect of each detail or circumstance on the general safety of the ship.

We are addressing you with the request that you assist us in the matter by forwarding any data of this character that you may wish to submit.

Information is particularly desired as to the condition of vessels that have foundered through stress of weather, that is, as regards their trim, stability, nature and stowage of cargo, structural strength of the hull and deck houses, condition of hatches and shifting boards, etc., at the time of the disaster, so that the relative influence of these features upon the loss of the vessel may be determined. The immediate cause of the loss should be stated, in all cases where it is known. These particulars are requested, from survivors or eye-witnesses, concerning all such disasters that have occurred on the lakes, at least since 1900, and general observations on all conditions affecting safety of lake vessels, will be appreciated.

Accompanying is a list of steel vessels lost on the lakes through foundering, during the years 1900 to 1919, and you are requested to advise us on any of the casualties of which you may have knowledge. The same particulars are required for wooden vessels similarly lost. If you are able to supply the names and addresses of others who can give any further details, kindly do so.

It is very necessary to the success of this investigation that first-hand information of this character be recorded, to supplement the technical and statistical data which is now being compiled, and, as the time for completing the work is limited, the committee urgently requests communications from all those interested, at the earliest possible date.

World Charter Market Reviewed by

FEAR RATE WAR

Obduracy of French Opens Breach in Atlantic Trades—New Board Contract Meets with Opposition

DESPITE the element of uncertainty interjected in the shipping situation by the political campaign, the business of ocean transportation is beginning to display some hopeful signs after months of inactivity and doubt. President Wilson made a desperate attempt to fill the five vacancies on the shipping board prior to the elections, but under the circumstances found it difficult to obtain enough competent men willing to accept office.

During the first six months of the current year, shipping board vessels transported 55 per cent of the export cargo shipped in American bottoms, and transported 37 per cent of the import cargo brought in American ships. Of all the cargo reaching or leaving American shores in ships of all flags, shipping board vessels transported approximately 29 per cent. These figures represent in a measure the potential power wielded by the shipping board. To have this power subjected to political manipulation would be disastrous to the country.

It has been shown furthermore that, due to continuance of labor troubles in Europe, especially the threat of the English miners, American vessels have been able to find better berths. Most of the large steel vessels tied up by the shipping board about a month ago on account of the lack of freights, have been returned to service. More export coal than the board can take care of has been offered for transportation overseas. The Carribean trade has been the best for the smaller steel ships, but conditions there have been unpropitious. Havana, the most important harbor, has been congested.

Operators Fear a Rate War

After long negotiations with the French line, the shipping board was compelled to acknowledge its failure to effect solidarity in the rate conference negotiations and orders were issued to operators to meet the rate cuts of their competitors. This action nullified practically all rate conferences with the exception of the United Kingdom conference. British lines still are disposed to work hand in hand with the American merchant marine, but the stubbornness of the French promises a rate war in services from the north and south Atlantic and gulf coasts of the United States to French Atlantic ports, Antwerp, Rotterdam, Hamburg and Bremen. Commenting on the attitude of the French line, Admiral Benson has been quoted as saying: "It is a war to the knife unless they return to the fold and play fairly with the conference." The French line, it is charged, has been holding out, demanding that the shipping board guarantee that line a certain minimum of the business in the competitive trades.

Beginning Nov. 1, the shipping board put in effect a base difference of 5 cents per hundred pounds on

flour over wheat. This action was taken to encourage the exportation of flour. Foreign shipping interests declare it was a political move to appease the American miller, alleging it is easier and cheaper to handle wheat and the 5-cent differential is not sufficient under the circumstances. It probably is true in this case that the power of a governmental organization has been used in the commercial field of shipping to lend encouragement to an American industry. Such a policy, adopted by the shipping board for the first time, indicates the enormous influence American shipping has over economic conditions in the country.

The shipping board has announced also a new agency contract for the management and operation of its vessels. This makes a payment of 5 per cent on outward and 2½ per cent on inward freight in place of a fixed sum per deadweight ton and a division of profits allowed in the contract put into effect last March. The new agreement is retroactive to March 1. The agreement does not meet with universal favor, but no uniform contract would. Some steamship owners now state that they would prefer a bare-boat charter from the government as under such an arrangement a steamship line by private initiative and efficiency would not be limited in its possible profits. On the other hand, there are some companies under the old agreement which show larger book profits than under the new agreement.

Charters Develop Strength

About the middle of October, charters were being maintained around the figures prevailing during the dark days of August. Ships were offered from Hampton roads to Rotterdam at \$9.50, to the French Atlantic at \$10 and \$10.50, to Scandinavian ports at \$13 to \$13.50, and to River Plate at \$12.50 to \$13. As the English coal crisis drew near a stiffening in the rates was observed. For the French Atlantic trade, many orders were in the market at \$11 and \$11.50 with at least one order for a spot steamer at \$12 per ton. Other European ports were slow to follow this lead but the indications were there would be further business available for Rotterdam, West Italy and French Mediterranean. However, ships were slow to take European berths, as they feared they would be unable to obtain bunker for the return. As a consequence, the River Plate and Brazil trades were crowded. Dutch ports have held good stocks of coal

Is Turbine an Engine?

IS A steam turbine an engine? This is the question raised in the application of the Northwest Steel Co., Portland, Oreg., in its action before the interstate commerce commission against the railroad administration for alleged overcharging on shipments of 46 carloads of marine steam turbines from the east to Portland. The turbines were assessed the freight rates applicable to engines, while the steel company asserts the machinery rate should apply. An engine is a prime mover of some description, while a turbine is a prime mover of a particular type, is the company's contention. The company was associated with the Columbia River Ship Building Corp.

Experts in This Country and Abroad

and the supplies in Scandinavian ports have been adequate.

There have been some grain orders in the market for Tunis, Antwerp and Rotterdam, from Montreal to Barcelona and Valencia, and from the Gulf to Mediterranean ports. From northern range ports to the United Kingdom, the nominal rate has been 12 shillings 6 pence per quarter, and from Antwerp and Rotterdam 14 shillings, while Spanish Mediterranean, Algiers and Genoa has offered from 17 shillings to 17 shillings 6 pence, with 1 shilling extra in each case for shipments from Gulf ports. Barley from San Francisco to the United Kingdom has been paying 125 shillings; flour \$20 a ton.

Time charter has been quoted at about 15 shillings per ton per month for a period of six months for large modern steamers, with proportionately increased rates for smaller sizes. These could have been fixed in American currency at about \$2.75 per ton. West Indian charterers have been slow although none has been prepared to take tonnage for round trips, or about six months, at about \$4 per ton, for small steamers. There was also an inquiry for somewhat larger steamers for west coast South American round at about \$3.50 per ton. Coal has been going out of Baltimore, Norfolk, Hampton Roads and some less important southern ports to Europe.

To Take Advantage of Trade

line was one of the first to announce its intention of entering the Mexican trade in competition with the Ward line and others already there. Munson will have a biweekly freight service from New York to Vera Cruz, Tampico and Progreso. The Five Continent and the Congress lines also will

American steamship lines are preparing to take advantage of the various changes in trade tendencies. Heretofore it has been a fight for the Cuban trade, but now greater hope is entertained for Mexico, inasmuch as apparently a stable government is about to be established there. The Munson

Millions Seek Passage

WITH the decline in the freight market there has been a tendency on the part of steamship companies to hold to the high passenger rates or to increase them. Some passenger increases have been noted in the Caribbean trade. The first class passenger traffic, transatlantic, has shown a decline, but there is a tremendous immigrant movement. It is reported that fully 3,000,000 people are awaiting in Italy for transportation to the United States. To help in this movement, six former transports have been leased to Phelps Bros. & Co. The Fabre and Italian lines ships have been jammed in the steerage for the past several months.

inaugurate services to Mexico. Page & Jones, Mobile, Ala., have started a service from Baltimore and other Atlantic ports to the west and east coasts of Africa. The S. O. Stray Steamship Co., New York, has concluded negotiations for the establishment of regular service from Philadelphia to Norwegian points. The Mallory line will reconstruct the SAN JACINTO for the coastal trade. The Pa-

BRISK IN BOSTON

Exporting Goes on at Lively Pace on Prewar Basis—West Indies Trading Has Been Demoralized

cific Mail will make Savannah, Ga., a port of call in its coastwise services.

Three failures in the steamship business are noted. These include Victor S. Fox & Co., the States Steamship Co., and the French-American line. The last named has been operating a fleet of upward of 25 vessels, and had contracted for the purchase of considerable shipping board tonnage. It was thrown into receivership upon petition of creditors. Abraham Frankel, president of the line, said he did not intend to retire from shipping, intimating that the receivership was for the purpose of preventing losses.

Plans of the International Mercantile Marine are of special significance. The government's mail contract with the American line of this company has terminated and it is announced the line will withdraw temporarily the passenger steamers ST. PAUL, NEW YORK and PHILADELPHIA. The two former are scheduled to make cruises to the West Indies. During the temporary withdrawal, the KROONLAND and FINLAND will operate in the New York-Cherbourg-Southampton run. The line will establish a service from Danzig to Hull as feeder to the White Star line from Liverpool to New York. The Red Star line, of this same holding company, already is operating directly between New York and Danzig. The International Mercantile Marine Co. has purchased the German steamship BERLIN from the British government and is in the market for other ex-enemy ships to build up its services.

The French line is inaugurating a passenger service from New York to Hamburg. The CAROLYNE and the NIAGARA will be used.

Freights Decline on West Coast

Ocean freights on the Pacific still are under pressure, the general tendency during the past month having been downward. Consequently freights are easy, tonnage is in ample supply and the situation is undergoing a readjustment which had been anticipated for months. Sailing ships continue in better demand than steamers. Of the latter there is a large supply and an increasing number is being added to the idle fleet. Those familiar with conditions look for no improvement in the near future and no less an authority than A. P. Haines, vice president of the Pacific Steamship Co., recently predicted the oriental situation will show but slight improvement in the next 10 months. He said: "Chaotic financial conditions in Japan and the extreme high exchange on silver will prevent business with the Orient for many months. The condition is not local, but is general, and was expected long before it matured."

General inactivity in chartering finds its counterpart in all the foreign markets in which the north

Pacific is interested. Due to declining ocean freights and the general downward tendency of all commodities, foreign buyers are unwilling to place any large orders, all business at present being of a hand-to-mouth order. While it is true not many vessels are idle at Pacific ports, it is a fact large carriers are being withdrawn from the oriental trade and placed on tramp routes. It is understood that the shipping board is insisting that from 60 to 75 per cent of the vessels' capacity be taken in order to keep this tonnage on certain routes.

Specify Foreign Tonnage

On all sides American tonnage is meeting with extremely severe competition. British buyers, who have purchased large quantities of wheat and flour in this market, are insisting on its being carried to its destination by British vessels. This accounts for the large number of foreign vessels carrying surplus foodstuffs from Pacific ports. It is true American tonnage is getting some of this business but the competition of other nations is very keen. The present rate on wheat or flour from north Pacific to United Kingdom is about \$20 per ton, which is the shipping board's level. However, foreign operators are willing to cut this and an announcement recently was made of a big British steamer chartered for this business at 110 shillings, which figures out at \$15.72 per ton at present exchange. There is no reason to believe this competition will be less severe because it is anticipated the supply of vessels will continue to exceed the demand.

Lumber Carriers Plentiful

While the shipping board conference rate on lumber to the Orient remains at \$17.50, it is an open secret that offers to move this cargo at as low a price as \$12 have been made. It is not long since this rate was \$25 but the reduction has not stimulated the movement of lumber, thus proving how depressed is the demand in the Orient.

Recent charters include a steamer for lumber to Cuba at \$25, a sailing vessel, British Columbia to South Africa, at \$42.50; schooner, North Pacific to Callao, at \$30, and a sailing vessel to Melbourne or Adelaide at \$35. Five shipping board vessels were recently fixed for railroad ties from Puget sound to United Kingdom at \$42.50. This rate was recently \$45.00 but during the last month there has been a continued decline. Offers in the market for lumber carriers include the following: New Zealand, \$32.50; Shanghai, \$15; West Coast South America, \$30; South Africa, about \$42.50; United Kingdom (ties) January-June, 1921, \$40 (American money).

The AMERIKA, former Hamburg-American liner, has been turned over by the shipping board to the United States Mail line, which will proceed to recondition her. This line has already received the GEORGE WASHINGTON, SUSQUEHANNA and the FREEDOM. As an aftermath of the Kerr-Harriman disagreement, it was learned that the shipping board has refused to allocate government tonnage to the Kerr Steamship Co. This was done because the heads of the Kerr line are not yet American citizens. On the other hand, W. A. Harriman has announced that the United American lines will extend their freight service between Hamburg and American ports later this year or the early part of next.

It is understood that the Cunard line may not establish its services between Liverpool and Boston before next spring. The IMPERATOR has made her

final trip of the year under the Cunard flag. The company, it is said, will return this giant vessel to the British government as the light winter traffic makes her unprofitable in the transatlantic trade.

The Russian-American line will resume its services between New York and Libau. The three former Russian steamers, the KURSK, CZAR and CZARINA, renamed the BALTAMER, BALTARA and BALTIDE, and now under the British flag, will be used. The vessels will be operated by the United Baltic Corp., Ltd., London.

The ex-German liner CORCOVADA now rechristened the GUGLIELMO PIERCE has been added to the fleet of the Sicula America and will be operated under the Italian flag to New York.

For South America, New York has had a number of orders for spot steamers, on which charterers have been indicating \$13.50 per ton for River Plate and Rio, with option of Santos at \$13.75. Charterers have been in the market also for October, November and December tonnage, any size, for the west coast of South America on which the majority have been quoting \$9 per ton, although there has been an indication that some would pay \$10.

Foodstuffs and coal have continued the main exports from American shores, but the port of New York has been getting none of these trades. Northern range, gulf and Pacific ports have been the shipping points for grain and they have been reporting considerable activity, large shipments of cereals going to the United Kingdom and the continent.

Exports on Increase at Boston

While the shipping situation has remained remarkably quiet at Boston throughout the past month, indications of increased export tonnage have recently developed. A year ago embargoes and labor difficulties operated to reduce Boston's portion of western grain shipments but this year these difficulties are not in the way and grain is moving along practically prewar lines. Several of the shipping companies report that bulk trade is improving. Cotton is commencing to move and while this does not directly affect Boston's offshore trade it brings a larger number of coastwise vessels into port and indirectly is the cause of considerable export tonnage of manufactured goods. Coal shipment has been subject to considerable fluctuation during the last few weeks. Undoubtedly either the rates will advance to shipping board level or the board will agree to a further reduction in the near future.

West Indies Trade Is Demoralized

The financial situation in Cuba and the West Indies has held up much freight scheduled for shipment from New England. Mediterranean and Black sea service have perhaps been more severely hit than any others and one line with sailings normally made every two weeks has not been able to complete cargo for a sailing during the last six weeks. At Portland, Me., conditions are decidedly favorable. The fall grain shipments are arriving in large volume and all indications point to excellent winter trade from freight originating in Canada. Boats that have been withdrawn from the service out of Boston during the past month either for winter storage or for transfer to some other port include the LAKE CHELEN and LAKE SEBAGO, owned by Crowell & Thurlow Co.; LAKE FIGERT, United Fruit Co.; HARTFORD, WORCESTER and SOQUESSOCK, C. H. Sprague & Co.; and COWETO, Lawrence & Co.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General Cargo cu. ft.	100 lbs.	††Finished Steel	Coal from Virginia cities
Liverpool.....	\$ 0.40	\$ 1.00	\$ 1.15	\$ 0.45	\$ 0.50	\$ 1.00	\$10.00 T	.....
London.....	0.40	1.00	1.15	0.45	0.50	1.00	10.00 T	.....
Christiania.....	0.60	0.90	2.00	0.65	0.70	1.50	15.00 T	13.50 T
Copenhagen.....	0.60	0.90	2.00	0.65	0.70	1.50	15.00 T	13.50 T
Hamburg.....	0.40	0.40	1.00	0.45	0.50	1.00	6.00 T	10.50 T
Bremen.....	0.40	0.40	1.00	0.45	0.50	1.00	6.00 T	10.50 T
Rotterdam.....	0.40	0.65	1.00	0.50	0.50	1.00	9.00 T	9.75 T
Antwerp.....	0.40	0.50	0.90	0.45	0.45	0.90	8.00 T	9.75 T
Havre.....	0.40	0.90	0.50	0.90	0.60	1.25	6.00 T	10.50 T
Bordeaux.....	0.40	0.90	0.50	0.90	0.60	1.25	8.00 T	10.50 T
Barcelona.....	0.75	30.00 T	1.50	0.80	—30.00 T—		18.00 T	11.50 T
Lisbon.....	0.75	30.00 T	1.50	0.80	—30.00 T—		18.00 T	11.00 T
Marseilles.....	0.70	1.25	1.70	0.75	0.70	1.50	15.00 T	12.50 T
Genoa.....	0.60	1.10	1.10	0.65	0.65	1.20	12.00 T	12.50 T
Naples.....	0.60	1.10	1.10	0.65	0.65	1.20	12.00 T	12.50 T
Constantinople.....		28.00 T	1.50	16.00 T	—28.00 T—		18.00 T	15.00 T
Alexandria.....	16.00 T	1.40	.....	16.00	0.62½	1.12	15.00 T	14.00 T
Algiers.....	20.00 T	1.80	.....	20.00 T	0.87½	1.56¼	14.00 T	12.75 T
Dakar.....	20.00 T	23.00 T	.....	23.00 T	—28.00 T—		20.00 T	.....
Capetown.....	30.00 T	27.00 T	27.00 T	30.00 T	—27.00 T—		20.00 T	.....
Buenos Aires.....		.....	.....	.....	—20.00 T—†		12.00 T†	12.50 T
Rio de Janeiro.....		.....	.....	.....	—22.50 T—†		16.50 T†	12.50 T
Pernambuco.....		.....	.....	.....	—23.50 T—†		17.50 T†	13.75 T
Havana.....	0.55*	0.63*	.....	0.55*	0.75*	0.94*	0.71*	6.00 T
Valparaiso.....	1.25	1.25	1.16	1.16	0.70	1.25	18.00 T	9.25 T
San Francisco.....		2.25	.....	1.10	.....		1.00	.....
Sydney.....		.....	.....	.....	25.00 to 30.00 T		15.00 T	.....

T—Ton. † Landed. †† Heavy products limited in length. * Extra charge for wharfage.

From North Pacific Ports to	Lumber Per M. ft.	From North Pacific Ports to	Lumber Per M. ft.
San Francisco.....	\$ 8.50	Peru-Chile.....	\$30.00
South California.....	9.50 to 10.00	South Africa.....	42.50
Hawaiian Islands.....	16.00 to 18.00	Cuba.....	22.00 to 23.00
New Zealand.....	30.00	United Kingdom.....	60.00
Sydney.....	30.00	United Kingdom (ties).....	40.00 to 42.50
Melbourne-Adelaide.....	32.50	New York.....	24.00
Oriental ports.....	12.50 to 15.00	New York (ties).....	20.00

From North Pacific Ports to	Flour and Wheat Per Ton	From North Pacific Ports to	Steel Per Ton
Oriental ports.....	\$10.00	Oriental ports.....	\$11.00
United Kingdom.....	18.00 to 20.00	From North Pacific ports to	Cotton Per Ton
Scandinavia.....	18.00 to 20.00	Oriental ports.....	\$20.00 to 25.00

Principal Rates to and From United Kingdom

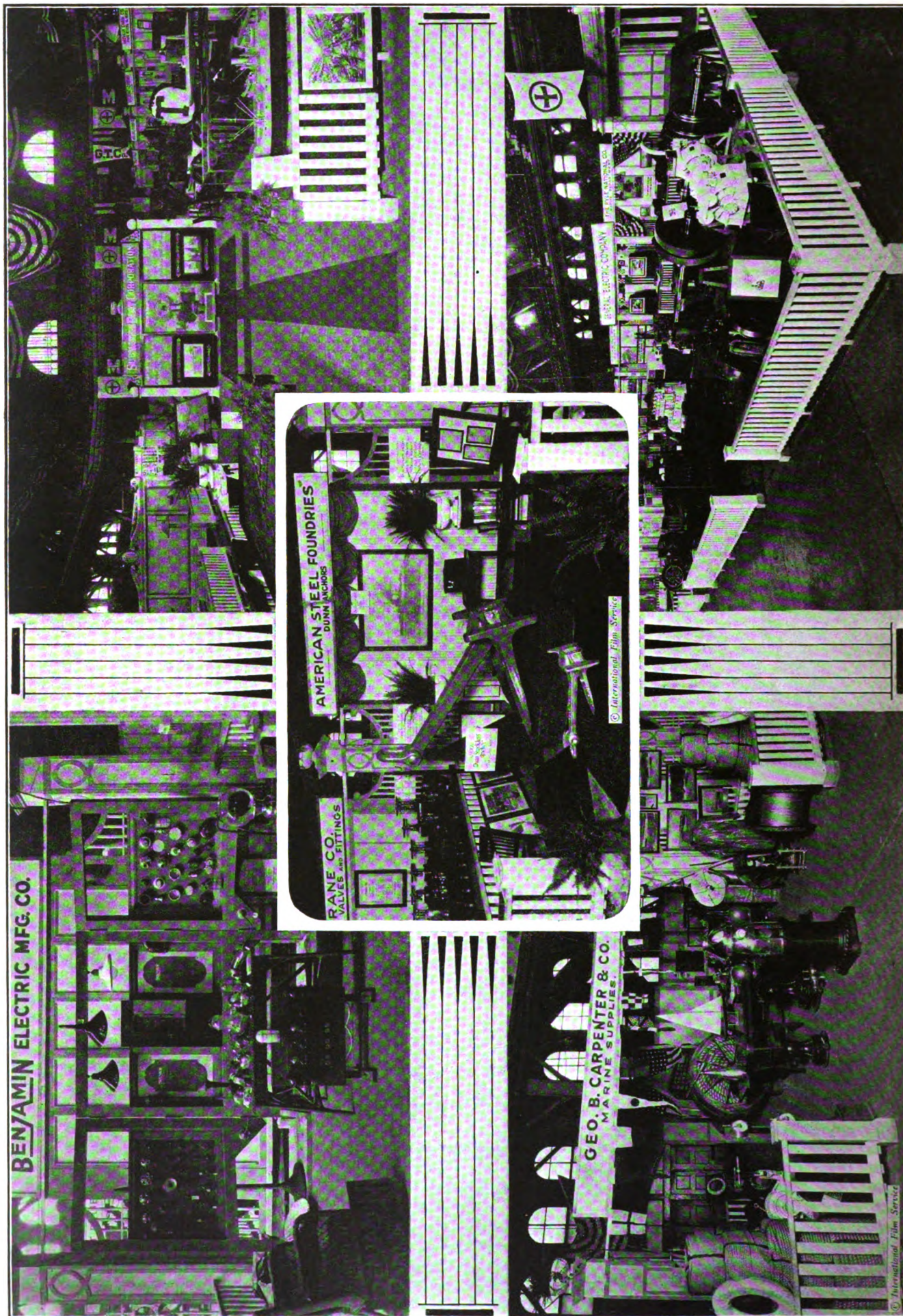
	s	d		s	d
Grain, River Plate to United Kingdom.....	80	0	Iron ore, Bilboa to Middlesborough.....	19	0
Coal, South Wales to the Near East.....	45	0	General British market, six months time		
Coal, Newcastle to France.....	25	0	charters, per ton per month.....	15	0

British Strike Settlement Aids Charters

(From Our European Manager)

London, Nov. 10. (By cable.)—Settlement of the coal strike has improved charter conditions. Coal exports have been resumed. In the Spanish ore trade, the flurry in the charter market has ended with the Bilbao-Cardiff rate relapsing to 17 shillings. Home-

ward chartering is more active. Conditions in the River Plate trade are quiet but values are steady. Cargoes for the Near East are more plentiful. Considerable activity in chartering Australia wheat has developed.



DISPLAYS AT THE CHICAGO EXPOSITION EMPHASIZED THE DIVERSITY OF FIELDS REPRESENTED IN THE MARINE INDUSTRY

Total U. S. Tonnage

At the end of the fiscal year June 30, 1920, the total American registered enrolled and licensed shipping, according to the returns of the bureau of navigation, department of commerce, consisted of 28,182 vessels of 16,324,013 gross tons, compared with 27,513 vessels of 12,907,300 gross tons on June 30, 1919. Of the year's increase nearly 90 per cent consists of seagoing ships of 1000 gross tons or over built at public expense and owned by the United States shipping board, which increased by 648 ships of 3,075,925 gross tons during the year, standing 1630 ships of 6,903,128 gross tons on June 30, 1920.

At that date the total American documented fleet consisted of 8103 steam vessels of 13,466,400 gross tons, 4030 sail vessels (including rigged barges) of 1,272,160 gross tons, 4891 unrigged barges (mainly harbor and inland) of 1,176,604 gross tons, 10,710 motor vessels (including a few large ones) of 357,037 gross tons, and 448 documented canal boats of 51,752 gross tons.

On June 30, 1920, of the total fleet 5958 vessels of 9,928,595 gross tons were registered for foreign trade, compared with 5032 of 6,669,726 gross tons on June 30, 1919, the year's increase thus being almost wholly in foreign-trade ships.

Tonnage enrolled and licensed for the coasting trade numbered 22,224 vessels of 6,395,418 gross tons, compared with 22,481 of 6,237,574 on June 30, 1919.

Record of Ship Work

That the shipyards are working at a considerably lower production pressure than for many months is evidenced by the number of boats

launched and delivered in October. Launchings still run ahead of deliveries but show a reduction from former months. A destroyer was among the vessels which took the water. Others launched or turned over to their owners were:

SHIP LAUNCHINGS

REAPER: Tanker; 430 feet x 56 feet x 32 feet 9 inches; at Bath, Me.; owner and builder, Texas Steamship Co.

CANADIAN COMMANDER: Freighter; at Montreal yard of Canadian Vickers, Ltd.; owner, Canadian government.

A. L. KENT: Freighter; at Bath Iron Works, Bath, Me.; owners, Crowell & Thurlow Steamship Co.

CLAN MACLEAN: Schooner; at Lunenburg, N. S. NORA: Tanker, at New York Shipbuilding Co. yard, owner, W. R. Grace & Co., New York.

AGWINEA: 12,600-ton tanker; at Sparrows Point, Md., yard, Bethlehem Shipbuilding Corp.; owner, Atlantic, Gulf & West Indies Steamship lines.

ITORORE: Refrigerator ship; Moore plant, Bethlehem Shipbuilding Corp., Elizabeth, N. J.; owner, International Products Steamship Co.

ROCHESTER SOCONY: Tanker for use on New York barge canal; at Moore plant of Bethlehem Shipbuilding Corp.; owner, Standard Oil Co., New York.

PAUL JONES: Destroyer; 314 feet x 31 feet; speed 36 knots; builder, William Cramp & Sons Ship & Engine Building Co., Philadelphia; owner, United States navy.

GEORGE F. WOOD: Freighter; 9000 tons; Chester, Pa., yard, Merchant Shipbuilding Co.; owner, Emergency Fleet corporation.

EMERGENCY AID: Freighter, 8800 tons; Harriman, Pa., yard, Merchant Shipbuilding Co.; owner, Emergency Fleet corporation.

BWORDENCO: Freighter; Newark bay shipyard; Oct. 22; owner and builder, Submarine Boat Corp.

SUJAMECO: Freighter; Newark Bay shipyard; Oct. 29; owner and builder, Submarine Boat Corp.

SHIP DELIVERIES

CHINA ARROW: Tanker; 485 feet x 59 feet x 26 feet; builder, Bethlehem Shipbuilding Corp., Quincy, Mass.; owner, Standard Transportation Co.

EASTERN SWORD: Freighter; built by Japanese yard; owner, United States shipping board.

McFARLAND: Destroyer; 318 feet long over all; speed 36 knots; builder, New York Shipbuilding Corp., Camden, N. J.; owner, United States navy.

JOHN STEVENS: 8800-ton freighter; builder, Merchant Shipbuilding Corp., Harriman, Pa.; owner, Emergency Fleet corporation.

OLD NORTH STATE: Combination passenger and freight carrier; tonnage, 12,000; builder, New York Shipbuilding Corp., Camden, N. J.; owner, Emergency Fleet corporation.

Disagree on Charges

Considerable difference of opinion has developed between shippers and ship operators at different Pacific ports as to the exact meaning of the terms f.a.s. or f.o.b. In other words, controversy has risen as to which party ought to absorb the cost of trucking from the pile in the warehouse to ship's tackle.

For many years prior to the war, it was the custom of the water carrier to accept grain or flour in piles in the warehouse as actual f.a.s. delivery. Thus the vessel paid the truckage charges, which ordinarily amount to 25 cents per ton. During the war and with the consequent shortage of vessels, this old custom was changed and the carriers refused to pay this additional cost. Now shippers of wheat and flour are asking the water carriers to revert to the prewar custom and accept delivery from piles in the warehouse.

It is known the shipping board and operators of American vessels are strenuously opposed to returning to the old system and are resisting the proposed change. The contention of these operators is that this controversy properly is a matter of agreement, when the charter is signed. On the other hand shippers point to the custom that prevailed for many years prior to the war.

This misunderstanding applies only to local cargo as present laws provide that on through bills of lading cargo must be delivered at ship's sling.

While American vessels are refusing to assume the additional charge, it is understood foreign carriers are willing to accept delivery at pile.

Hold Big Exposition at Chicago

SUCCESS marked the efforts of the National Marine league to hold its first large exposition in the middle west. The first show of this kind was held in Chicago Oct. 18-23. The number of exhibitors was larger than had been anticipated while the attendance throughout the week demonstrated the interest taken by residents of the Middle West in maritime subjects.

The exposition was the second of its kind held in this country in recent years, the first taking place in New York in April of this year. Both expositions revealed to a striking degree the new appeal which marine affairs now arouse among American citizens no matter where they reside. The league's efforts primarily are devoted

to the stimulation of a more active and intelligent interest in maritime subjects as a means of winning the necessary degree of congressional attention which will give the new merchant marine its proper share of legislative support.

Chicago was chosen not only from its rank in the tremendous trade of the Great Lakes but also because of its position as the most populous city of the middle west. The exhibits generally represented more clearly the activities of American shipping on the ocean than on the lakes and for that reason served as a greater stimulus to the development of interest in ocean shipping.

From a commercial viewpoint the exposition also established a satisfac-

tory record. Many of the exhibits were in operation, naturally arousing the greatest interest. All of the exhibits had been carefully planned and on account of the large number of firms participating, the display covered thoroughly the many-sided activities of the marine industry.

Rather an interesting decision was recently handed down by the state district court of appeals at San Francisco. The court held that the charter party or instrument through which a ship is chartered cannot be construed as a contract for the payment of money. In consequence, an attachment was dissolved against a vessel alleged to have failed to fulfill a charter party agreement to freight a cargo of copra.

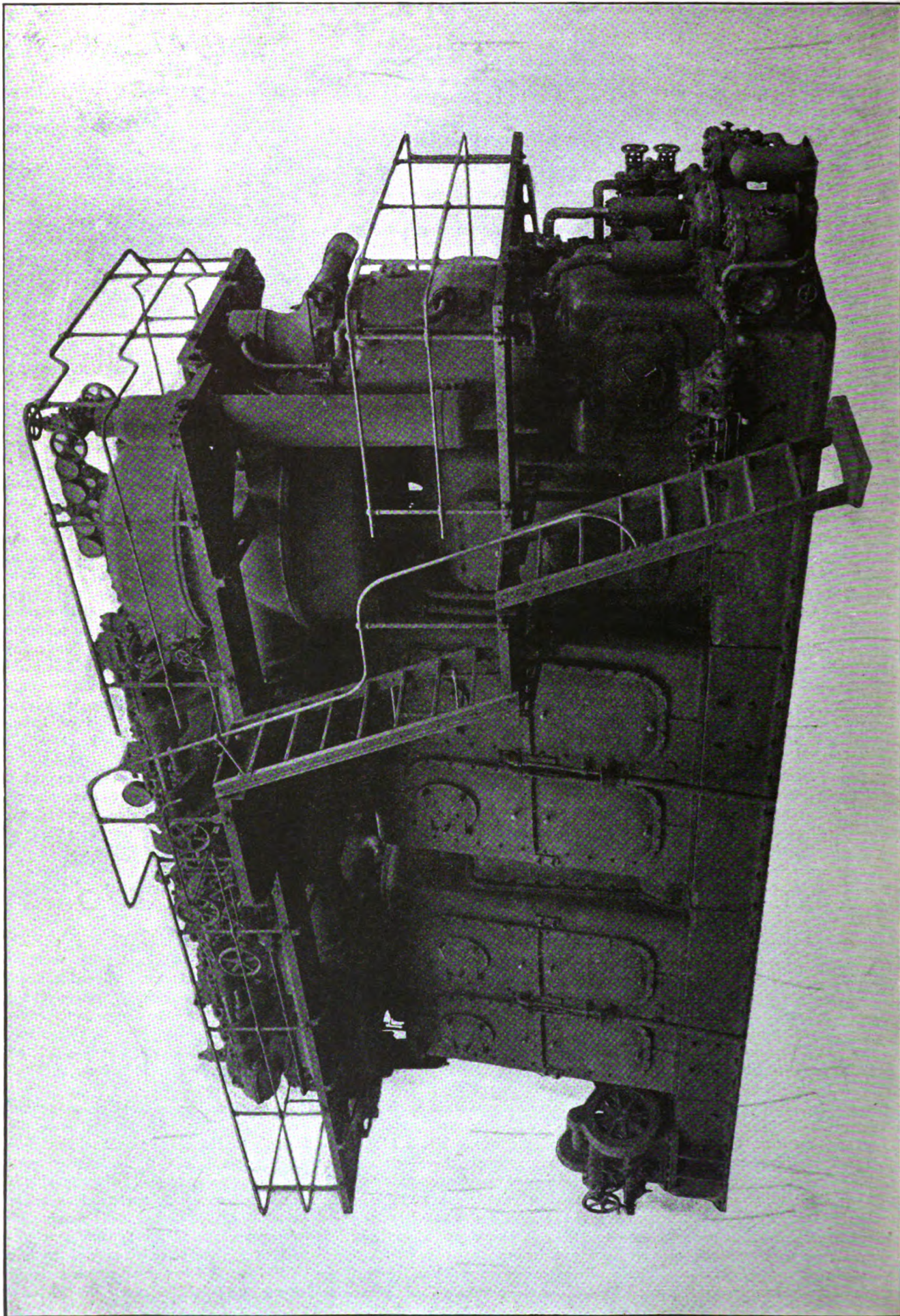


FIG. 1—BUSCH-SULZER 1100-BRAKE HORSEPOWER, 2-CYCLE MARINE ENGINE

Building Diesel Marine Engines For Merchant Vessels-I

Difference between 2 and 4-cycle diesel engines is explained—Thoroughly scavenging the cylinders of burned gases is of importance

THIS is the first of a series of two articles describing diesel marine engine manufacturing methods at the Busch-Sulzer Bros.-Diesel Engine Co., St. Louis. This article describes the 2-cycle type engine in detail, pointing out how it differs in operation from the 4-cycle. The second article will explain the various details of manufacturing and assembling methods. The diesel engine has been built in this country since 1898 and is extensively used in marine propulsion as well as for stationary installations.

WHILE the first diesel engine was placed in operation but 23 years ago, this means of developing power has gained worldwide recognition as an efficient and dependable agency for ship propulsion. The first successful diesel engine was built in Europe in 1897 while the initial engine of this type to be constructed in the United States was built for Adolphus Busch of St. Louis, in 1898. This engine was built under American rights secured from Dr. Rudolph Diesel, inventor of the engine that bears his name.

The diesel engine is an internal combustion unit which utilizes directly in its cylinders any heavy liquid fuel ranging all the way from coal tar to kerosene. The operation of this type of engine does not involve carburetors or ignition systems. In operation, pure air is admitted to the cylinders, the air being compressed by the upward stroke of the piston to a pressure of from 450 to 500 pounds. Due to compression, the temperature of the air increases from normal to about 1000 degrees Fahr. When the piston is near the end of its upward stroke the fuel is sprayed into the cylinder. The spraying is gradual with the fuel in a finely nebulized condition. The heat generated by compressing the air as the piston travels upward is suffi-

BY FRED B. JACOBS

cient to fire the charge without other means. The fuel burns during the first part of the down stroke after which the hot gases in the cylinder continue to expand and exert a force on the piston until they are exhausted from the cylinder.

The rate at which the fuel is injected into the cylinder is under control and is so adjusted that ignition

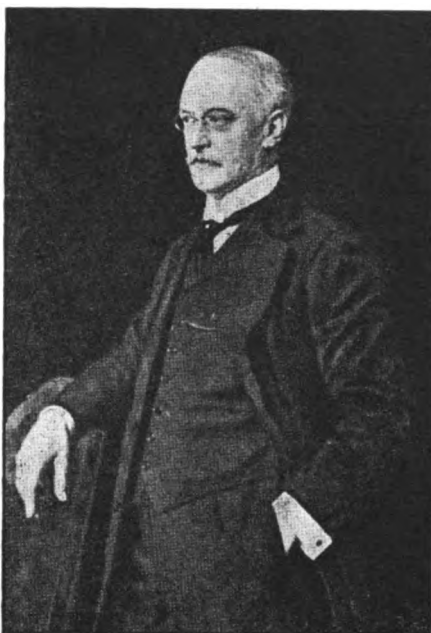


FIG. 2—DR. RUDOLPH DIESEL, WHO COMPLETED THE FIRST SUCCESSFUL DIESEL ENGINE IN 1897

and combustion take place without explosive violence and with substantially no change of pressure. To this phenomenon is due the fact that engines of this type are sometimes called "constant pressure" type engines to distinguish them from the "constant volume" type such as gas, gasoline and hot-bulb oil engines erroneously termed semidiesel engines. Diesel engines are built to operate on either the 2 or 4-cycle principle.

Principle of 4-Cycle Engines

To make clear the principle on which the engine works it may be well to explain each system briefly. The 4-cycle principle is shown in Fig. 4. Four piston strokes, or two revolutions of the crankshaft, are necessary to complete the cycle of operations. The first or admission stroke is shown at *A*. As the piston travels down, the ad-

Engine described is a self-contained unit made in 4 and 6 cylinder designs—Operates on 2-cycle principle and is easily reversed

mission valve opens. This fills the cylinder with pure air. The second, or compression stroke, is shown at *B* with the piston traveling upward. All the valves are closed and, consequently, the air is being compressed. In the third stroke, shown at *C*, the piston travels downward. The fuel valve is open near the top dead center but it closes after a small fraction of the downward stroke has been completed. During this stroke, sometimes termed the impulse stroke, the gases expand driving the piston downward. In the fourth, or exhaust stroke, shown at *D*, the piston travels upward with the exhaust valve open to rid the cylinder of the burned gases.

A typical 4-cycle diesel engine indicator card is shown in Fig. 3. On this diagram the lines representing the various operations are lettered to agree with Fig. 4. The constant pressure combustion, which is a distinguishing feature in the diesel engine, is readily evident from this diagram.

In the 2-cycle engine, two strokes of the piston corresponding to one revolution of the crankshaft are required to complete the cycle of operations. These operations are shown in Fig. 7. In the first stroke, shown at *A*, the piston travels downward with all ports closed. Fuel is injected and burned during the first part of the stroke and as the piston travels downward the gases expand. In *B*, the piston is still traveling downward when it uncovers the exhaust ports through which the burned gases escape reducing their pressure to that of the atmosphere. In *C*, the piston is still traveling downward, the exhaust ports are still uncovered and the scavenging valves open allowing air under light pressure to enter the cylinder. This blows out the remainder of the burned gases. In *D*, the piston is traveling upward. It covers the exhaust ports, the scavenging valve is closed and the air in the cylinder is being compressed. Fig. 8 shows a typical indicator diagram from a 2-cycle diesel engine.

The fuel generally used in diesel engines is crude petroleum and the

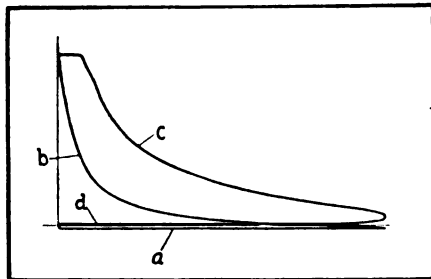


FIG. 3--TYPICAL 4-CYCLE DIESEL ENGINE INDICATOR CARD

heavier petroleum distillates or fuel oils. Kerosene and tar oils are used but rarely in this country for this purpose, due to the fact that their relative cost is high while the practical efficiency derived is low.

The Busch-Sulzer company has adopted the 2-cycle engine for large marine installations after exhaustive study and experimentation to determine whether this type shows high efficiency for marine service. The 2-cycle principle has several advantages that should not be overlooked. Perhaps the most important advantage is that exhaust valves for the outlet of the burned gases are eliminated.

In the early days of internal combustion engines the 2-cycle type gained favor as a means of marine propulsion, owing to the fact that it gave an impulse every revolution of the crankshaft instead of every alternate revolution as is the case with the 4-cycle type. As an offset to this inherent advantage, however, the 2-cycle engine

of other days possessed a decided handicap since the cylinder was not wholly scavenged of the burned gases before the fresh charge was injected.

At the present time two systems are employed in scavenging the cylinders of large diesel engines. These are known as head scavenging and port scavenging. In the head scavenging system, air enters the cylinder through valve controlled ports in the cylinder head while the burned gases are let out through ports in the side of the cylinder wall.

Port Scavenging Explained

In port scavenging, air is passed into the cylinder under slight pressure through controlled ports in the cylinder wall. In considering this system it is obvious that the scavenging ports must not be uncovered until the pressure of the burned gases in the cylinder has fallen below that of the scavenging air. Otherwise the burned gases would rush into the scavenging air receiver and, the gases being in a state of combustion at the time, would cause an explosion that might bring about disastrous results. When working at full load, the terminal pressure in a 2-cycle diesel engine cylinder is approximately 40 pounds to the square inch while the scavenging air pressure seldom exceeds 4 pounds. Thus it is necessary that the exhaust ports be uncovered in advance of the scavenging ports. The amount of this earlier opening is usually set at approximately 8 per cent of the piston stroke.

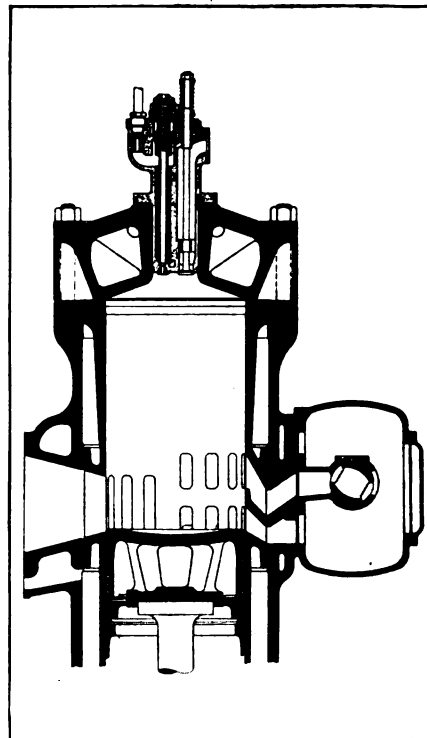


FIG. 5--SECTION THROUGH THE SCAVENGING VALVE AND CYLINDER

In earlier designs, this system presented a serious drawback to economical operation in that the efficiency of the engine was lowered. This is due to the fact that on the down stroke the scavenging ports are uncovered after the exhaust ports so that on the upstroke the exhaust ports are closed after the scavenging ports. The result of this is that at the time

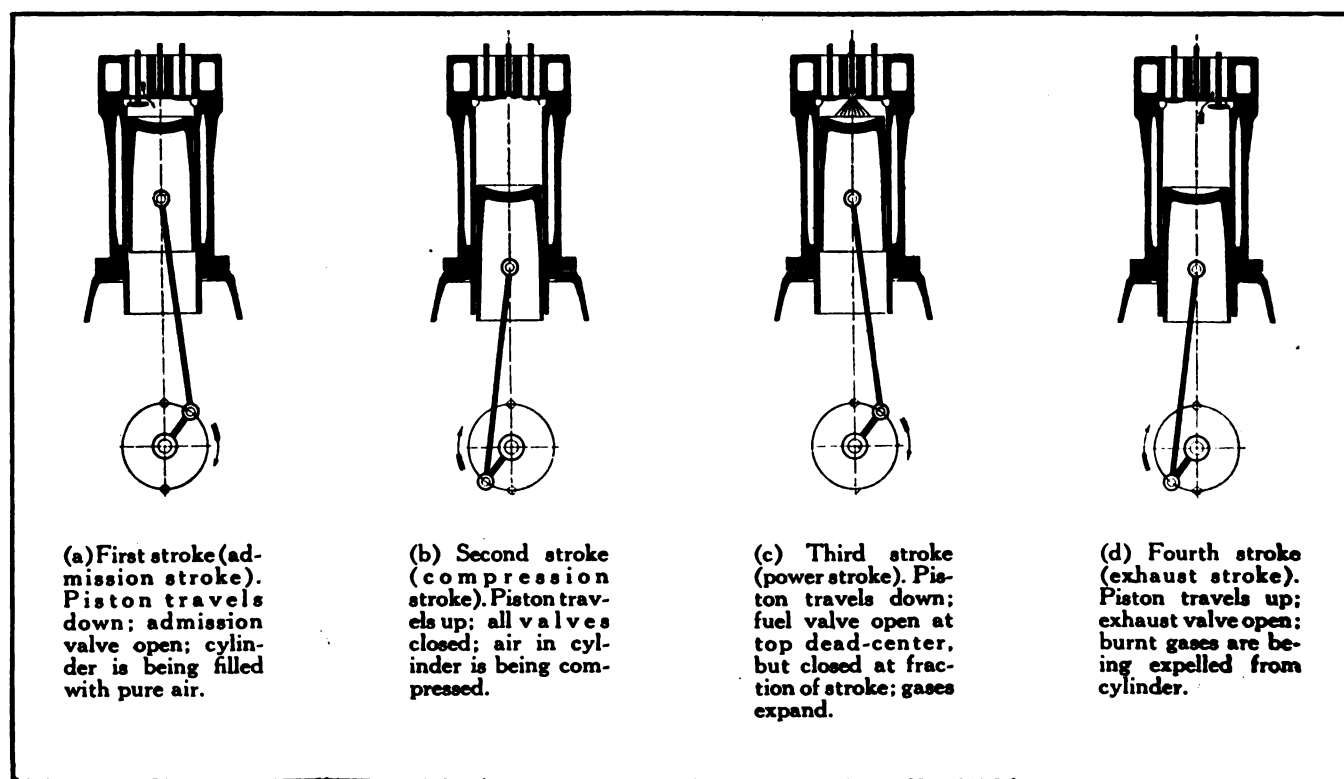


FIG. 4--PRINCIPLE ON WHICH THE 4-CYCLE TYPE OF DIESEL ENGINE WORKS

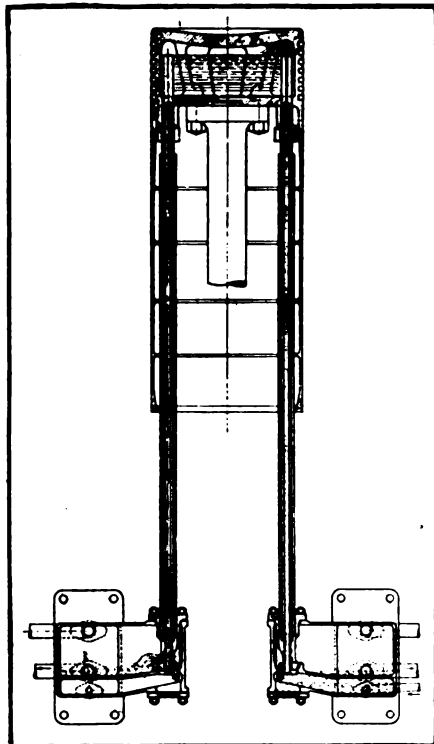


FIG. 9—TELESCOPE TUBE PRINCIPLE UTILIZED IN PISTON COOLING

the piston in its upward travel covers the exhaust ports, at about 20 per cent of the stroke, the cylinder is filled with air at only slightly above atmospheric pressure, this air being compressed in the remainder of the stroke. Thus the weight of air compressed does not exceed 85 per cent of the weight of a cylinder full at atmospheric pressure. This led to the design of the scav-

enging valve shown in Fig. 5. This is known as the Sulzer scavenging system and utilizes the principle of port scavenging but it employs two tiers in place of one tier of ports. In operation, the piston uncovers the upper tier of ports before and the lower tier after it uncovers the exhaust ports. At the same time, communication between the interior of the cylinder and the scavenging air supply or receiver, through the upper ports, is controlled by a timed and mechanically operated rotary valve with two ports situated well out of the reach of heat and dirt. It operates slowly the period available for its opening and closing being equivalent to more than $1\frac{1}{4}$ strokes of the piston. This valve remains closed until the exhaust ports have been uncovered long enough to reduce the pressure of the gases in the cylinder nearly to that of the atmosphere. Then the valve is opened while the piston uncovers the lower scavenging ports which causes a rapid and thorough purging of the cylinder. This feature, it is pointed out, results in protection against a blowback.

Blowbacks Are Prevented

On its return stroke, the piston first covers the lower scavenging ports and then the exhaust ports, while the upper scavenging ports and their valve remain open enabling the scavenging air to fill the cylinder at full scavenging pressure before communication is shut off by the moving piston. By this system it is claimed that a blow-

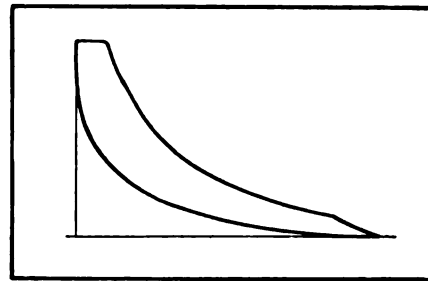


FIG. 8—TYPICAL 2-CYCLE DIESEL ENGINE INDICATOR CARD

back of burned gases into the cylinder cannot occur and the double tier arrangement and the form of the scavenging ports insure a thorough purging of the cylinder. As a matter of fact, tests conducted recently have proved that the amount of burned gases remaining in the cylinder does not exceed 3 per cent. The weight of air thus compressed is the weight of a cylinder full at atmospheric pressure permitting the consumption of the full quantity of fuel injected. The cylinder liner with its scavenging and exhaust ports is shown in Fig. 10.

The operation of the scavenging and charging system is simple and interesting. It is shown in detail in Fig. 9. In *A*, the piston covers all ports while the scavenging valve is closed. The piston is on its down, or impulse stroke, the gases have been fired and are burning and expanding. During the first part of this stroke, the valve opens and fuel injection and combustion occur.

The piston has uncovered the upper scavenging ports in *B* but the scavenging

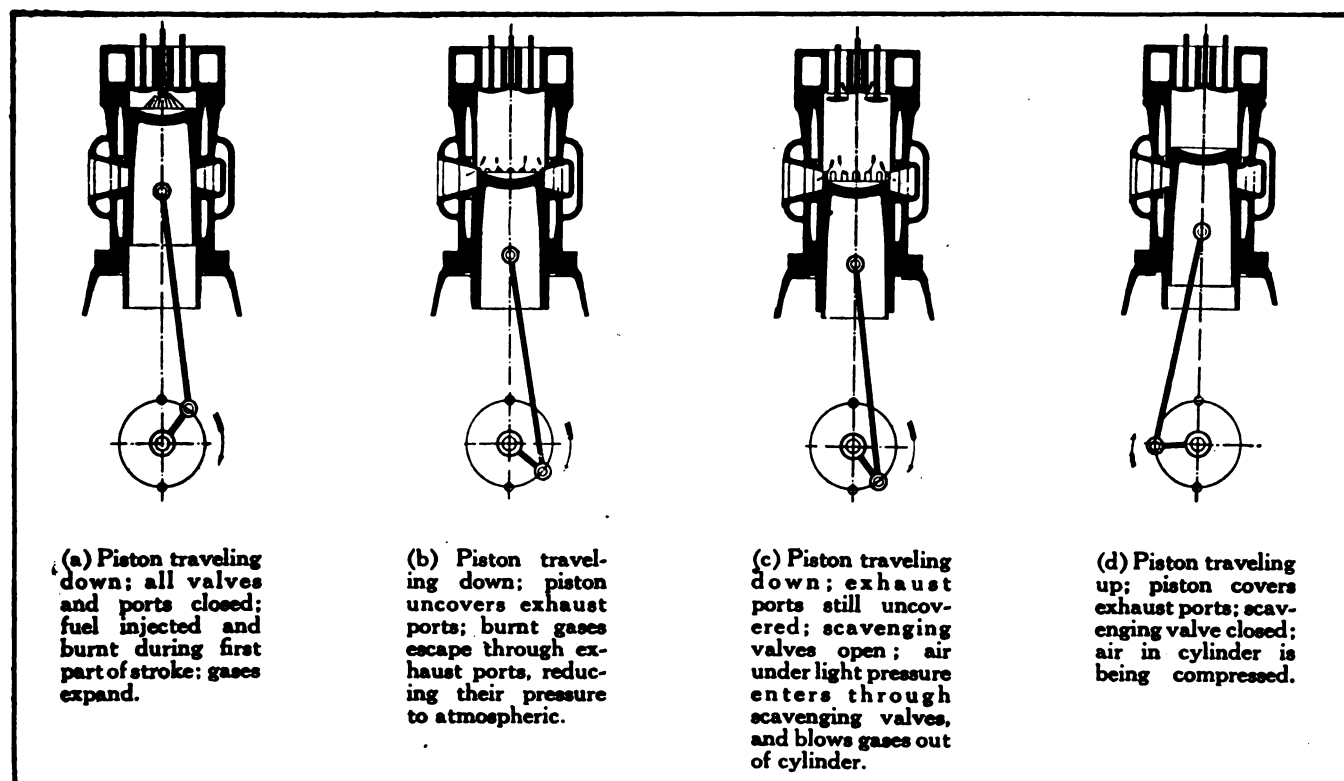


FIG. 7—PRINCIPLE ON WHICH THE 2-CYCLE TYPE OF DIESEL ENGINE WORKS

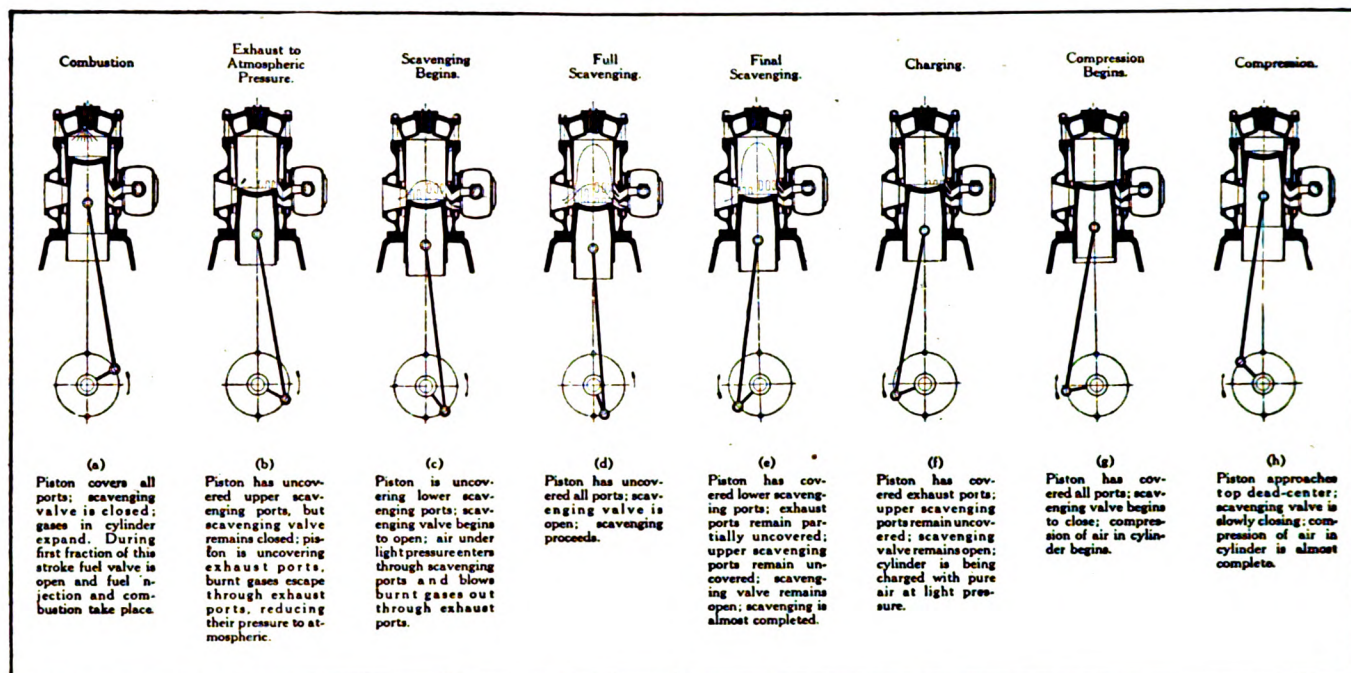


FIG. 9—HOW THE SCAVENGING AND CHARGING SYSTEM OPERATES ON A 2-CYCLE BUSCH-SULZER MARINE ENGINE

valve remains closed. The piston is uncovering the exhaust ports and the burned gases are escaping, reducing their pressure in the cylinder to that of the atmosphere.

The piston is uncovering the lower scavenging ports in *C* and the scavenging valve is beginning to open. This causes air under light pressure to enter the cylinder through the scavenging ports. This air blows the burned gases out through the exhaust ports.

In *D*, the piston has uncovered all ports and as the scavenging valve remains open, scavenging is proceeding.

The piston now traveling upward has covered the lower scavenging ports in *E*. The exhaust ports remain partially uncovered while the upper scavenging ports are still uncovered. The scavenging valve remains open and scavenging is nearly completed.

Charging the Cylinder

In *F*, the piston has covered the exhaust ports while the upper scavenging ports remain uncovered. The scavenging valve remains open and the cylinder is being charged with pure air at light pressure.

The piston has covered all ports in *G* and the scavenging valve begins to close while compression of the air within the cylinder begins.

In *H*, the piston approaches the top dead center. The scavenging valve is slowly closing and compression of the air in the cylinder is almost completed.

An 1100 brake horsepower 4-cylinder, 2-cycle, Busch-Sulzer-diesel marine type engine is shown in Fig. 1. This unit is a vertical, 4-cylinder, single acting, crosshead type, giving one power stroke per cylinder per revolution of the

crankshaft. This eliminates vibration. The bed plate shown in Fig. 12 is built up of sections of medium soft cast iron and is provided with ample flanges planed on their under sides for rigid bolting to the foundation. The bed plate comprises an oil collecting trough with bridges between each two cylinders. These bridges contain the bored seats for the main crankshaft bearings. Four bearings are provided. The crankcase, which takes the

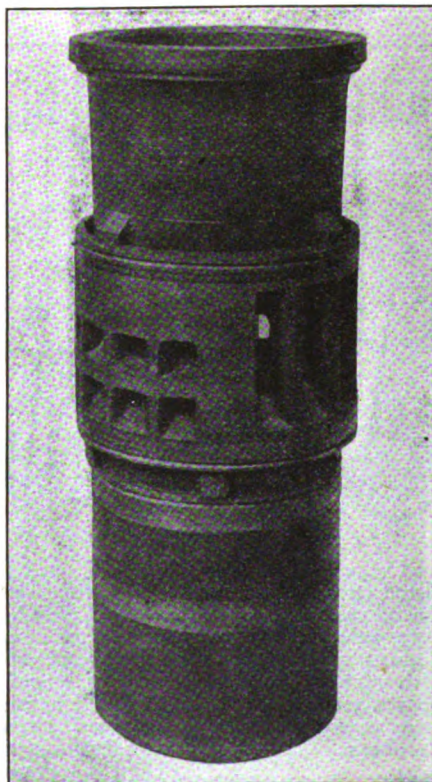


FIG. 10—CYLINDER LINER USED ON 2-CYCLE DIESEL ENGINES

place of the main frames in an ordinary marine engine, is of the enclosed type, oil and gas tight, and is built in sections. It is bolted to the top of the bed plate and is equipped with large covers which are readily removed for purposes of inspection and adjustment. Thus all working parts within the crankcase are accessible for inspection at all times. The covers carry hinged inspection doors for convenience in making inspections while the engine is in operation. The doors are so placed that the engineers and oilers on watch can examine the inside of the crankcase without being deluged by oil thrown by the working parts.

Cylinders Carry Liners

Each cylinder consists of two main parts—an outer jacket and a liner. The outer jacket takes all axial stresses while the liner forms the running barrel. When a liner is badly worn it can be easily replaced. The lower end of the outer jacket is bolted to the top of the crankcase while the upper end is equipped with studs to hold the cylinder head in place. The cylinder jacket is provided with holes for inspection and cleaning of the cooling water spaces.

The liner is hard, close grained iron and is provided with slots or ports in its wall for the admission of the scavenging air and the discharge of the exhaust gases. The upper end of the liner seats on a shoulder in the jacket where it makes a watertight joint. The center belt, that portion of the liner at the scavenging and exhaust ports, is turned to fit a bored seat in the jacket and is equipped with packing to make watertight and gas-

tight joints above and below the ports. The lower end of the liner carries the oil-wiper rings and passes through the bottom flange of the cylinder jacket where a stuffing box is provided to make a watertight joint between the outside of the liner and the lower end of the cylinder jacket. The entire construction is designed to allow free expansion of both parts while the space between the liner and the jacket constitutes the water jacket.

The cylinder heads are cast iron of symmetrical design containing but one central opening of comparatively small diameter which accommodates the combined fuel valve and starting valve cage. This feature, it is pointed out, is designed to insure freedom from casting and heat stresses. As the heads do not contain scavenging and exhaust valves, ample and unobstructed space for water cooling is provided. The cylinder head is securely bolted to the top of the cylinder jacket with a registered fit on the cylinder liner. The under, or combustion space, side of the head is concave which forms in conjunction with the concave top of the piston a symmetrical combustion space. The cylinder heads are equipped with hand holes to permit inspection and cleaning of the water space.

Valves and Valve Drive

The rotary scavenging valve is driven from a vertical shaft which in turn is driven from the crankshaft through the medium of spiral gearing. The fuel valve is of the enclosed type and opens upward. In addition to timing the admission of starting air, the starting valve is arranged to relieve the compression in the cylinder which facilitates starting with a minimum consumption of air at a low pressure. The fuel and starting valve are carried in a single water cooled cage which is located in the central opening in the cylinder head. The camshaft which carries the cams for operating the valves extends in front and along the tops of cylinders in an enclosed casing. It is driven from the crankshaft at engine speed through a pair of helical gears at the lower end of the vertical shaft and a pair of bevel gears at the upper end. This drive is located at the flywheel end of the engine and taken off the crankshaft on the flywheel side of the first journal where it is least subjected to torsional strain.

Reversing is obtained through the medium of a double set of starting and fuel cams, and the necessary levers and gear to permit the direction of rotation of the crankshaft to be promptly reversed. This gear is air operated and is equipped with interlocking devices to safeguard the engine

against being started or reversed with the gear in improper position.

An overspeed governor is installed to prevent racing. This unit functions by cutting off the supply of fuel to the cylinders when the speed exceeds a predetermined limit for which the governor can be adjust-

valves. This point is controlled by hand from the control levers. The fuel piping is equipped with visible overflow valves which free the lines from any accumulated air which would interfere with prompt starting.

The piston comprises two units—the piston proper and the skirt. The piston proper is comparatively short, being just long enough to accommodate the piston rings. It is provided with a water jacket just under the upper face. The piston rod is attached to the lower flange through the medium of studs. The piston rings are single-piece units machined to a fit after they have been split. This assures their fitting the cylinder wall closely to give maximum compression and minimum leakage of gases. The piston is water cooled by an ingenious system which is illustrated in Fig. 6. Water is injected into the cooling chamber in the piston head and conducted away by a system of telescopic tubes. The skirt is fitted in place just below the piston. The only function of the skirt is to cover the scavenging and exhaust ports.

Piston Rods Are Forged Steel

The piston rods are forged open-hearth steel machined to size. The upper end of the rod is equipped with an internal flange for attaching it to the piston. The lower end is forked to connect with the crosshead pin.

The crosshead pins are high carbon, open-hearth steel forgings. The central part of the pin forms the bearing for the connecting rod. At each side of this bearing the forked end of the piston rod is bolted. The ends of the pin carry the crosshead. Shims are provided between the crosshead pin and the end of the piston rod which permit adjustment of the cylinder compression.

The cross heads are cast iron with babbitted sliding faces. They are of the double, central guide type to which no loose or adjustable pieces are attached. Adjustment is provided with liners under the stationary guides, bolted to the crankcase.

Connecting rods are forged open-hearth steel with marine type cross-head and crank ends. The end bolts are soft steel designed so as to avoid localized stresses and to resist crystallization. The crosshead pin and crank-pin boxes are cast steel, lined with babbitt and are adjustable by means of shims. Dovetailed grooves are machined for anchoring the babbitt in the boxes. Also, to insure a good bond between the box and the babbitt, the boxes are tinned before molten babbitt is poured in place.

The crankshaft is made in three sections, each being from a single, open-

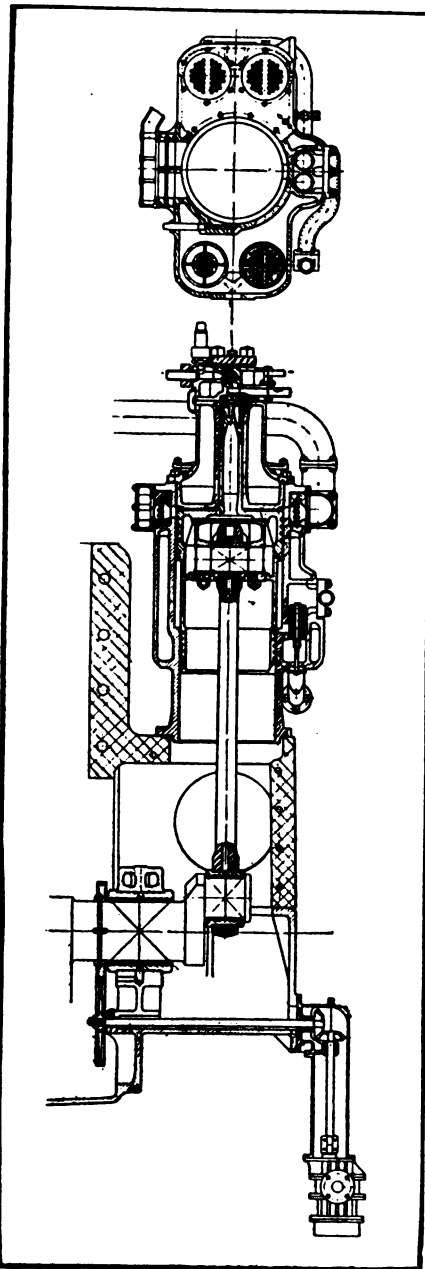


FIG. 11—CROSS SECTION THROUGH COMPRESSOR

ed. The supply of fuel is automatically re-established as soon as the engine speed falls to normal.

The fuel pump is of the multiple plunger type with one plunger for each cylinder and is operated from the vertical shaft. The duty or function of this pump is to deliver to each cylinder the quantity of fuel necessary to maintain the desired speed and develop the required power. The amount of fuel delivered is determined by the seating point of the fuel pump suction

hearth steel, heat-treated forging. Each main section carries two cranks for a 4-cylinder and three cranks for a 6-cylinder engine. Integrally forged flanges are provided at both ends. The two main sections are interchangeable with each other. The third section carries the cranks for driving the scavenging pump and air compressor and is equipped with an integral flange for bolting to the main section. All corners are filleted. The shaft is bored to permit examination of the

the main bearing caps which are fitted and rigidly bolted to the bed plate. Seats for the bottom half shells are aligned before the shells are placed in position. After the shells are seated in place, they are scraped to the crankshaft for alignment.

The flywheel is carried on an extension shaft which is connected to the crankshaft by a solid forged coupling flange. The flywheel rim is provided with slots to facilitate barring over the engine by motor. The out-

section through the scavenging pump is shown in Fig. 13.

The suction and discharge valves are of the "shutter" type mounted in cages. These valves are interchangeable. The intake side of the pump is provided with a valve chest arranged so that the scavenging air may, if desired, be brought from outside the engine room. The discharge side is provided with a valve chest with connections to the scavenging air receiver which, in turn, provides the

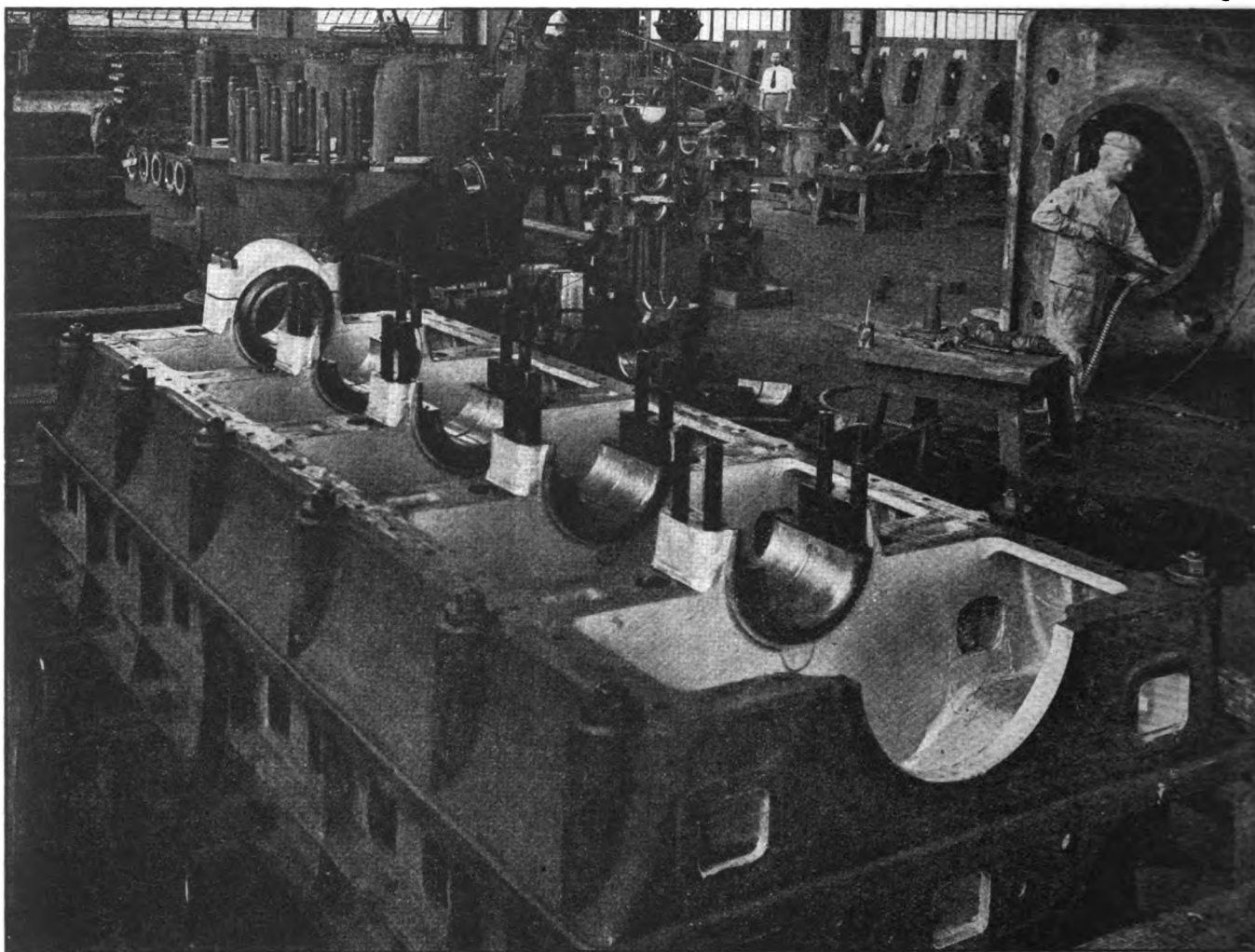


FIG. 12—BED PLATE WITH LOWER BEARING SECTIONS IN PLACE—THESE ARE SCRAPED TO BRING THEM IN ALIGNMENT

material and to afford a passage for the lubricating oil. The shafts are made to specifications especially covering the class of steel and quality of manufacture required for marine service.

The main bearings are cast iron, made in halves, cylindrical in shape and lined with babbitt which is anchored and tinned in place. The bottom half shells are fitted and scraped into bored seats in the bed. The top half shells are fitted into bored seats in the bearing caps. Between the two sections, shims are provided to furnish means of adjustment. The shells are securely held in place by

board bearing which is combined with the thrust bearing, supports the extension shaft beyond the flywheel and is carried by a section bolted to the main bedplate.

The scavenging pumps of 4-cylinder engines for providing low pressure scavenging and charging air for the working cylinders, are mounted vertically on the crankcase at the opposite end from the flywheel, next to the forward working cylinder with which it is in line. They are directly driven from the cranks on the extensions to the main crankshaft and are provided with crossheads and guides similar to those in the working cylinders. A

connection to the working cylinders.

The scavenging air receiver is cast iron extending along the front of the engine and is bolted to faces on the working cylinder jackets. It provides a firm support for the valve gears, camshaft bearings and casings. The receiver is fitted with a pressure relief valve. The suction and discharge valve chests are fitted with large covers to provide ready access to the valves. The scavenging air receiver is equipped with covers for access to the rotary scavenging valves.

The air compressor for providing compressed air for fuel injection and for starting, is placed vertically on

the crankcase at the forward end of the engine, in line with the working cylinders. It is driven direct from the crankshaft by means of an extension carrying a crank. The compressor is of the 3-stage type, water jacketed and equipped with intercoolers and aftercoolers. This keeps the air at the requisite low temperature. The piston is of the differential trunk type with removable piston pin housing. The compressor valves are designed without springs and are readily removed for inspection and cleaning. The second and third stage valves and seats are steel. Each stage of the compressor is protected against excessive pressure by a safety valve. A regulating device is incorporated to adjust the injection air pressure to suit operating conditions. The air coolers are constructed to afford ready access for inspection and cleaning. They are equipped with oil and water separators and drains.

The engine is started through the medium of compressed air which is provided by the injection air compressor. Air starting is provided for all cylinders, one-half of the cylinders are started first followed by the other half.

The injection and starting air piping is heavy, seamless tubing equipped with high pressure fittings. The air starting and storage tanks are heavy in design and are provided with shut-off valves and drains. The starting tanks are so designed that they can be charged from the compressor without interfering with the operation of the engine. Each tank is equipped with a fusible plug to relieve pressure in case of fire.

The air compressor, cylinder heads, cylinders, pistons, fuel and starting valve cages, exhaust manifolds and oil coolers are equipped with arrangements for water cooling. All overflow and bypass connections are exposed and all cooling water is discharged into accessible open funnels. Individual outlet pipes are provided for each cylinder so that the temperature of the discharge water can be instantly taken at any time.

The pressure lubricating system is incorporated which includes all main bearings, crank and crosshead pin bearings, crossheads, vertical shaft, thrust bearing and lower helical gear. The oil after passing through the bearings is collected in the bed plate. From here it flows through a twin filter to a positive displacement pump which forces it through a cooler. From here it is again forced through the oiling system at a pressure of from 10 to 20 pounds to the square inch. A safety valve is provided on the oil pressure

pipe as well as on bypass connections for the regulation of the pressure. Camshaft bearings are equipped with all rings. The cylinders, including the cylinders of each stage of the compressor, are oiled by a multifeed pressure type oil pump. Oil cups are provided where they are necessary.

(To Be Concluded.)

German Mails Heavy

The American liner MONGOLIA, sailing from New York to Hamburg, carried out a consignment of Christmas mail

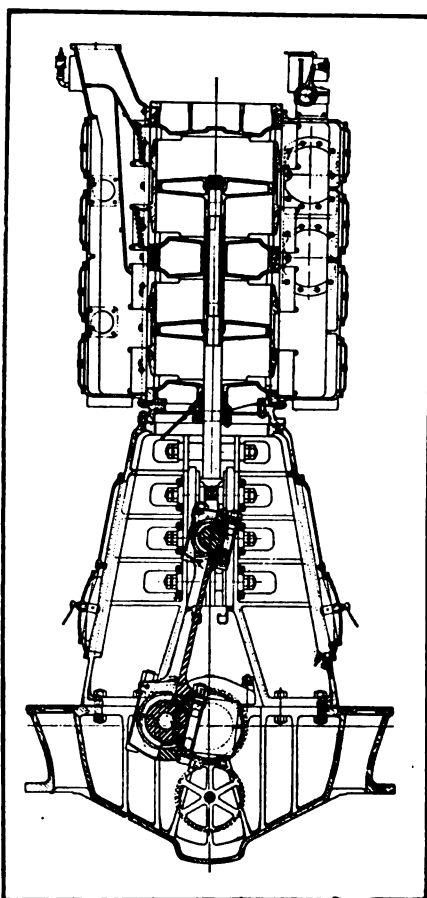


FIG. 13—CROSS SECTION THROUGH SCAVENGING PUMP

for Germany, totaling more than 7000 sacks. This ship, and her sister ship, the MANCHURIA, have carried the bulk of the German mails out of New York for nearly a year. The American line reopened mail service to Germany after it had been interrupted for more than five years by the war, with the sailing of the MANCHURIA from New York on Dec. 20, 1919, carrying the largest cargo of mail ever taken out of New York harbor, a total of 14,104 sacks.

The American liners convey the mails from pier to pier, New York to Cuxhaven, in 10½ days. These boats carry also first and third class passengers and from 8000 to 10,000 tons of freight a trip—largely food for Germany.

File New Ship Plans

Three additional companies have taken advantage of the Jones shipping act to make application for construction of new ships under its provisions. The law carries certain tax exemptions for boats built according to its approval. Applications for constructing 31 boats now have been made by various American shipping companies. In addition to those listed in last month's issue, the following applications have been approved:

United Fruit Co.: One bulk oil tanker of 63,000 42-gallon barrel capacity, to be constructed by the New York Shipbuilding Corp., Camden, N. J.

Union Oil Co. of California: Two oil tankers of 12,000 deadweight tons, to be constructed by the Southwestern Shipbuilding Co., East San Pedro, Cal.

Calvert Navigation Co.: One bulk oil steamer of 6050 deadweight tons, to be constructed by the Baltimore Dry Docks & Shipbuilding Co., Baltimore.

Regulations which the law provides shall be promulgated by the shipping board are in course of preparation, the board acting with the treasury department.

Under the British flag, a fleet of German-built freighters, of unusually large tonnage, is coming to north Pacific ports to carry grain to Great Britain. These carriers were turned over to the British under terms of the armistice. The steamer FRIESLAND, which loaded at Seattle, left with the largest single cargo of wheat ever shipped from Puget sound in one vessel. This vessel took 13,516 long tons or 504,598 bushels valued at \$1,300,000. The previous largest cargo of grain from Puget sound was shipped in November 1915, when the American steamer MINNESOTA took 12,000 tons of wheat and barley.

Because of the decline in grain prices and to place Seattle on a parity with Columbia river rivals, the port of Seattle has reduced charges for storing and handling grain at port terminals about 50 per cent. Under the former schedule, the public properties were receiving no grain which was moving through private terminals. Under the new tariff the charge for wharfage, including unloading cars or handling from ship's side, piling and 10 days' free storage, is 75 cents per ton for sacked grain.

With the inauguration of airplane service between Seattle and Victoria, B. C., a saving of a day has been effected in the movement of postal matter to and from the Orient. The first consignment of oriental mail to leave Seattle by airplane consisted of 13 bags.

Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

THE history of legislation by congress relating to registering and enrolling ships is set out in the decision of *SCANDINAVIA II*, 258 *Federal Reporter* 144. "The first congress in 1789," said the court, "provided that no ship should be registered or enrolled unless it was wholly owned by a citizen or citizens of the United States. So anxious was it to prevent evasion of its policy in this respect that it withheld the privilege of registry from any ship owned wholly or in part by a citizen of the United States, who usually lived abroad, unless he was an agent or a partner of some firm of American citizens actually carrying on business in the foreign country in which he was living.

"By act of March 3, 1825, c. 99, 4 Stat. 129, provision was for the first time made for documenting vessels owned by American corporations; but even then, by its fifth section, the president or the secretary of the corporation was required to make oath that, to the best of his knowledge and belief, no part of the ship was owned by any foreigner, and this section remained the law for 33 years, until it was repealed by act of June 11, 1858, c. 145, 11 Stat. 313. Since then the executive departments have granted documents to vessels owned by a corporation organized under the laws of any of the states, without inquiry as to the nationality of its stockholders."

Congress, from time to time, gave more or less sanction to this practice. In 1911, the attorney general officially advised the secretary of commerce and labor that an American corporation, as respects the shipping acts, was an American citizen, no matter how large a proportion of its stock was owned by aliens. The court continued: "War is no respecter of legal fictions and, under stress of the world conflict, congress, when it came, in 1916, to create the United States shipping board, declared that for the purpose of that act no corporation should be deemed to be a citizen of the United States unless the controlling interest therein was owned by citizens of the United States. Since the passage of the last mentioned act the bureau of navigation has refused to register, license, or enroll any vessel belonging to a corporation the majority of whose stock is not owned by American citizens."

* * *

A corporation which charters a barge for a fixed time, and to have exclusive possession, assumes the liability of a bailee, it was said in the case of *Mulvaney vs. King Paint Mfg. Co.*, 256 *Federal Reporter* 612. In discussing this liability the court said: "Where,

by contract of bailment, the hirer has either expressly or by fair implication assumed the absolute obligation to return, even although the thing hired has been lost or destroyed without his fault, the contract embracing such liability is controlling, and must be enforced according to its terms. A bailee who assumes but the common-law liability is exempt from liability for loss of the consigned goods arising from inevitable accident. But the bailee may, however, enlarge his responsibility by contract, express or fairly implied, and render himself liable for the loss by destruction of the goods committed to his care. The bailment or compensation to be received therefor being a sufficient consideration for such an undertaking.

* * * * So, an express provision in a contract of bailment for hire to keep the subject of the trust safely will not enlarge the common-law liability of the bailee, for such an obligation the law implies, that is to keep as safely as an ordinarily prudent man would his own goods. Such a provision will not constitute the bailee and insurer for the safety of the thing bailed; and, should it be destroyed by unavoidable casualty or stolen without the fault of the bailee, he will not be responsible."

* * *

Section 879 of New York City charter, declaring that no vessels shall lie at the end of piers, except at their own risk of injury from vessels entering or leaving any adjacent dock or pier, does not absolutely prevent a vessel lying at the pier end from recovering against manifest tortfeasors, it was said in the case of *NEW YORK CENTRAL No. 18*, 257 *Federal Reporter* 405. "But a violation of the statute," the court continued, "is sufficient evidence and sufficient reason for imputing fault to the violator. The consequence of such violation is, by the statute, that the violator can not recover for injuries inflicted by a vessel 'entering or leaving adjacent pier'—i. e., slip. Our decisions * * * hold that this absolute prohibition of recovery does not bind the courts of the United States, at least sitting in admiralty; but we have fully recognized the statute as establishing a valid rule for the management of the harbor. A departure therefrom, like a departure from any other legal rule, is evidence of negligence, and casts on the violator the burden of showing affirmatively that the violation did not contribute to the injury giving rise to suit."

* * *

"The admiralty doctrine of salvage is regarded from the standpoint of the vessel owner, as a concession to the spirit of the time when a ship in dis-

stress was looked upon as the lawful prize of all who might plunder her. From the viewpoint of the advocates and supporters of the doctrine, it springs from the sense of justice, which would grant compensation to the salvors out of that which their efforts have saved from destruction, and from the policy of the law, which would second the impulse of humanity by rewarding prompt and successful efforts to rescue lives and property from threatened danger. Such a rescue evokes the gratitude of the one saved and a spirit of liberality in rewarding the rescuer. The measure of compensation, when it is to be judicially determined, is influenced by many factors, among which is the risk incurred by the salvors, the imminence of the danger which is averted, and what is saved to the owners, as well as the labor which is involved. The results in loss actually incurred may indicate little risk to the salvors, and the smallness of the danger averted, or it may be a tribute to the promptness and efficiency of the rescuers, and justify a liberal estimate of salvage.

"Another feature of importance is the presence or absence of other promise of assistance than that rendered. Many of the elements which enter into an award of salvage compensation or allowance are difficult of admeasurement."—*JOHN J. HOWLETT*, 256 *Federal Reporter* 971.

* * *

"A vessel may be so established in her course on the wrong side of a narrow channel, and may so clearly and seasonably indicate to an approaching vessel her intention to stay there, that, if the other vessel have ample opportunity to size up the situation and avoid her, and does not do so, but brings about a collision through her own negligence, the statutory violation is regarded as a mere condition, and the accident as due wholly to the negligence of the vessel which failed to avoid it when she had a clear chance to do so by the exercise of reasonable care. Such severe requirements of exculpation can, however, but seldom be met. If the approaching vessel acted not unreasonably on the assumption that the other vessel would give way and maneuvered accordingly, or was confused and embarrassed by the other vessel holding to its wrongful course, exculpation is not made out. * * * The conditions of modern traffic, both on sea and on land, are emphasizing the importance of the right-hand rule. 'The Golden Rule of navigation is to keep to the right.'—*Commonwealth & Dominion Line, Ltd., vs. Seaboard Transportation Co.* 258 *Federal Reporter* 707.

Practical Navigation Guide--VII

Useful Application of Sumner Line Evolved by St. Hilaire — Submarine Signals—Requirements for U. S. Government License

BY V. G. IDEN

A USEFUL application of the Sumner line has been worked out by Marcq St. Hilaire. In this instance, the position of the ship is worked out by dead reckoning for a particular hour in advance. This is plotted on the chart, and the line of azimuth drawn. At right angles to this line the expected Sumner line is plotted. Suppose this calculation has been made in advance for the anticipated position of the ship at 8 o'clock. When that hour is reached an observation of the sun is taken and the true altitude reckoned from it. If the previously computed altitude and the true altitude found by observation are the same, then it is known that the first calculation was correct.

But if the true altitude is found to be greater than the calculated altitude, then it is known that the ship is nearer the sun than the position originally plotted. The position of the ship should therefore be moved nearer the sun on the chart in proportion to the difference in these two altitude readings. In Fig. 16, the position of the ship previously reckoned for 8 o'clock would be *P*, and the anticipated Sumner line would be *AB*. When the 8 o'clock observation was taken, however, it was found that the true altitude was 10 minutes higher than expected. The ship's position is, therefore, moved toward the sun 10 minutes along the azimuth line. The position obtained by observation would be *P'* and the corrected Sumner line would be parallel to *AB*. Obviously if the true altitude obtained by observation had been less than the previously calculated altitude, the position of the ship would have been moved in the opposite direction, away from the sun. In this day of the wireless, navigation is being simplified and with due precaution most accidents can be avoided. During the great war

with Germany the United States navy improved the wireless signals along the coasts and by sending and receiving signals from ships off-shore constantly, positions are not extremely difficult to fix even in the thickest of fogs. It is almost the universal practice now for merchant ships to be equipped with wireless and time is telegraphed to all vessels at sea. In this manner the correction of the chronometer can be easily found, making unnecessary any undue effort on the part of the navigator to make his calculations independently or by sights.

One of the devices growing in popularity on vessels is the submarine signal. This is used extensively in the navy and merchant vessels are beginning to concede it more and more consideration. By its use dangerous shoals and coasts can be located even when navigation records are incorrect. The submarine signal is a device by which the sound of a bell ringing under water can be picked up by the ship. Bells are lowered about 20 feet into the water at lighthouses, lightships and at dangerous points along the coast. Ringing

of the bells is controlled and they can be made to ring out the number of the light-station.

The sound travels through the water to the sides of a passing ship, which has two receiving boxes fastened to either of its sides, inside the shell, but as low down as the design of the vessel will permit. The side of the ship forms one side of the receiving box, and two sets of recorders are enclosed in each of the boxes. The recording sets are duplicated in order to insure constant use. Should one be out of working order the other might not be. From these recording sets the sound waves are transmitted electrically to the bridge of the ship or any other convenient place where they can be listened to through an apparatus resembling a telephone instrument with two receivers. The two receivers are used that the navigator may listen with both ears and thereby keep out any accidental surrounding noises. Small boats can pick up the sound of a submarine bell for a distance of from 3 to 8 miles. Larger boats can perceive the ringing from distances of from 5 to 15 miles. They can determine accurately from what direction the sound is coming. Sound coming dead-ahead will be heard as clearly through the port recording set as through the starboard recording set. The ringing bell a few points to the port will be heard from the port side with greater distinctness but will not be heard at all from the starboard. And when heard from the starboard side it will not be heard from the port. A conscientious and careful use of this instrument frequently has demonstrated its utility in dangerous positions. Its perfection should lead to a great modification of navigation practice. The recent war, which brought into play the deadly use of the submarine, quickened the

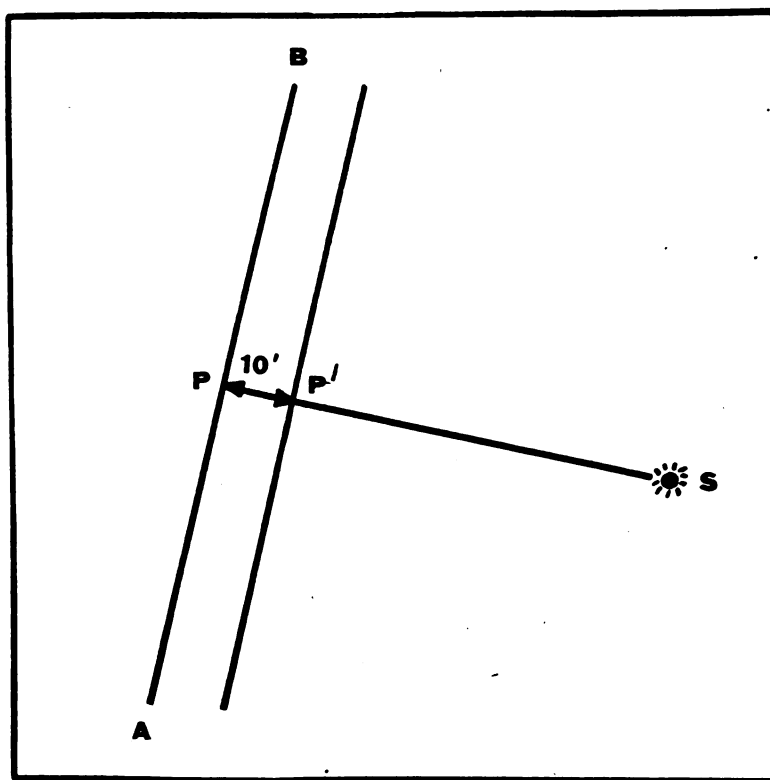


FIG. 16—DIAGRAM DEMONSTRATING ST. HILAIRE'S METHOD

minds of navigators to the importance of newer and simpler implements of their trade. The application of wireless and the improvement of underwater listening devices may not have been the direct inspiration from these dangers; but their improvement and more universal adoption by merchant vessels certainly was.

The general rules and regulations of the United States board of supervising inspectors require that a duly licensed master shall be aboard every steam vessel of more than 150 gross tons whenever such steamer is under way; also upon every ocean and coastwise seagoing merchant vessel of the United States propelled by machinery, and upon every ocean-going vessel carrying passengers, subject to the inspection laws of the United States.

An applicant, who has served in a lower grade than that for which he is licensed, may substitute service in the grade next below that for which he is licensed, which service shall count one-half in computing experience for raise of grade. For example, if an applicant holds a chief mate's license and has served nine months as chief mate and six months as second mate, the six months' service as second mate shall count as three months as chief mate in computing experience.

An applicant for master's license on ocean steam vessels must have the following experience:

First.—One year's service as chief mate of ocean steam vessels, or

Second.—Two years' service as second mate of ocean steam vessels, one year of such service while holding a license as chief mate of ocean steam vessels, or

Third.—Two years' service as watch officer actually in charge of a bridge watch on ocean steam vessels, while holding a license as chief mate of ocean steam vessels, or

Fourth.—Five years' service as third mate of ocean steam vessels, two years of such service while holding a license as chief mate of ocean steam vessels, or

Fifth.—Five years' service on ocean sail vessels of 300 gross tons or over, two years of such service while holding a license as master of sail vessels, or

Sixth.—One year's service as master or chief mate of coastwise steam vessels.

The applicant must pass a satisfactory examination in the following subjects:

1.—Latitude by meridian altitude of the sun.

2.—Latitude by ex-meridian altitude of the sun

3.—Latitude by meridian altitude of a star.

4.—Latitude by pole star.

5.—Longitude by chronometer (a. m. and p. m.).

6.—Position by Sumner's method.

7.—Day's work

8.—Mercator's sailing.

9.—Deviation of the compass by an amplitude.

10.—Deviation of the compass by an azimuth.

11.—Time of high water at a given port.

12.—Chart navigation.

13.—Storm signals.

14.—International code of signals.

15.—International rules for preventing collisions at sea.

16.—Use of gun and rocket apparatus for saving life from shipwreck, as practiced by the United States coast guard.

17.—Such further examination of a nonmathematical character as the local inspectors may require.

Service requirements of an applicant for license as master of coastwise steam vessels and for sail vessels are not so severe. The examination of an applicant for master of coastwise steam vessels requires a knowledge of the subjects enumerated 1, 4, 7, 12, 13, 15, 16, 17, and "Determination of distance from a fixed object." But a master of a coastwise steamship on routes not exceeding 300 miles is not required to master the art of reckoning position by celestial observation. A master of a sailing vessel is required to have a knowledge of 1, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, and 17.

Chief Mate and Second Mate

An applicant for license as chief mate of ocean steam vessels must have the following experience:

First.—One year's service as a licensed second mate of ocean or coastwise steam vessels, or

Second.—Two years' service as watch officer on ocean or coastwise steam vessels, while holding license as second mate of ocean or coastwise steam vessels, or

Third.—Two years' service as third mate of ocean or coastwise steam vessels, one year of such service, while holding a license as second mate of ocean or coastwise steam vessels, or

Fourth.—Two years' service as master of lake, bay, or sound steam vessels of 1000 gross tons or over, or

Fifth.—Five years' service in the deck department of ocean or coastwise sail vessels of 200 gross tons or over, two years of which service as chief mate of such ocean or coastwise sail vessels, or

Sixth.—Two years' service in the deck department of steam vessels engaged in the ocean or coastwise fisheries, one year of such service to have been as master of such vessels, or

Seventh.—Five years' service in the

deck department of sail vessels engaged in the ocean or coastwise fisheries, two years of such service to have been as master of such vessels.

In cases, where the experience of an applicant for license as chief mate of ocean steam vessels does not meet the specific requirements above enumerated, other service which the local inspectors consider a fair and reasonable equivalent may be accepted by them in lieu of the service specified.

The experience required of a second mate is as follows:

First.—One year's service as third mate of ocean or coastwise steam vessels, or

Second.—Three years' service in the deck department of ocean or coastwise steam vessels, one year of such service shall have been as watch officer or quartermaster on such vessels, or

Third.—A graduate from the seaman-ship class of a nautical school ship together with three months' service in the deck department of ocean or coastwise steam vessels, or

Fourth.—Three years' service in the deck department of ocean or coastwise sail vessel of 200 gross tons or over, one year of such service shall have been as second mate of such vessels, or

Fifth.—One year's service as quartermaster of ocean or coastwise steam vessels while holding a license as third mate of ocean or coastwise steam vessels, or

Sixth.—Three years' service as a seaman in the deck department of ocean or coastwise sail vessels together with one year's service in the deck department of ocean or coastwise steam vessels, or

Seventh.—Five years' service in the deck department of ocean or coastwise sail vessels of 100 gross tons or over. Service on sail vessels engaged in the ocean or coastwise fisheries shall be accepted as meeting the requirements of this paragraph, or

Eighth.—One year's service as first-class pilot of lake, bay, or sound steam vessels of 500 gross tons or over, together with three months' service in the deck department of ocean or coastwise steam vessels, or

Ninth.—One year's service as master of lake, bay, or sound steam vessels of 500 gross tons or over.

Examinations given applicants for license as chief mate or second mate on ocean steam vessels include the following subjects:

1.—Latitude by meridian altitude of the sun.

2.—Latitude by meridian altitude of a star.

3.—Longitude by chronometer (a. m. and p. m.).

4.—Deviation of the compass by an amplitude.

- 5.—Deviation of the compass by an azimuth.
- 6.—Day's work.
- 7.—Mercator's sailing.
- 8.—Determination of distance from a fixed object.
- 9.—Chart navigation.
- 10.—Storm signals.
- 11.—International code of signals.
- 12.—International rules for preventing collisions at sea.
- 13.—Stowage of cargo.
- 14.—Use of gun and rocket apparatus for saving life from shipwreck, as practiced by the United States coast guard.
- 15.—Such further examination of a nonmathematical character as the local inspectors may require.

Examinations of chief mate or second mate in the coastwise service on runs exceeding 600 miles include subjects enumerated 1, 6, 8, 9, 10, 12, 13 and 15. When the license is for the coastwise service on runs of 600 miles or less, the examination includes subjects enumerated 8, 9, 10, 12, 15 and "Aids to navigation on route," and "Marking of lead line."

Third Mate

An applicant for license as third mate of ocean steam vessels must have the following experience:

First.—Two years' service in the deck department of ocean or coastwise steam vessels, or

Second.—Three years' service in the deck department of ocean or coastwise sail vessels, or

Third.—A graduate from seamanship class of a nautical school ship, or

Fourth.—One year's service as master or pilot of lake, bay, or sound steamers, or

Fifth.—Any person, who has attained the age of 19 years and has graduated from a regularly established high school or college, may, upon the recommendation of the master under whom he has served, be examined for third mate of ocean or coastwise steamers after having served not less than 12 months as junior officer of ocean or coastwise steamers of 2000 gross tons or over.

His examination will cover the following subjects:

- 1.—Latitude by meridian altitude of the sun.
- 2.—Day's work.
- 3.—Mercator's sailing.
- 4.—Determination of distance from a fixed object.
- 5.—Chart navigation.
- 6.—International rules for preventing collisions at sea.
- 7.—Stowage of cargo.
- 8.—Storm signals.
- 9.—Such further examination of a nonmathematical character as the

local inspectors may require.

The examination of a third mate on steam vessels in the coastwise service includes subjects enumerated 4, 5, 6, 8, 9, and "Marking lead line."

(The End)

Naval Architects Meet

The twenty-eighth annual meeting of the Society of Naval Architects and Marine Engineers was held in New York, Nov. 11 and 12. The business sessions took up the major part of the members' time, though an interesting program of entertainment was provided. It included a tour of inspection of the plant of the Federal Shipbuilding Co., Kearny, N. J. The question of increasing the initiation fees and annual dues was a question for consideration.

An interesting list of papers were read and discussed at the meeting, among which were:

Thursday, Nov. 11

"University of Education in Ship Construction and Marine Transportation," by Prof. Lawrence B. Chapman, member.

"Launching of Ships in Restricted Waters," second paper, by Lieut. Com. Harold E. Saunders, CC., United States navy, member.

"New 20,000-ton Tankers," by Harold F. Norton, member.

"Economic Cargo Ships," second paper, by Alfred J. C. Robertson, member.

"Notes on Rivets and Spacing of Rivets for Oil Tight Work," by Hugo P. Frear, member of council.

Friday, Nov. 12

"Comparative Tests of Bilge Keels and a Gyro-Stabilizer on Model of the United States Aircraft Carrier LANGLEY," by Com. William McEntee, CC., United States navy, member.

"Surface Condensers," by Luther D. Lovekin, member.

"Rules and Regulations for Freeboard," by David Arnott, member.

"Recent Advance in Oil Burning," by Ernest H. Peabody, member.

"The Problem of the Hull and Its Screw Propeller," by Rear Admiral Charles W. Dyson, United States navy, member.

Buys Boat From British

Transfer to American registry of the 17,000-ton, British built, steel freighter MINNEKAHDA, and the vessel's early conversion to a passenger carrier, to be operated in the American line's service to Germany, were announced Oct. 20 by the International Mercantile Marine Co., on the ship's arrival from London. Bids have been invited by the company from American shipyards for refitting the ship to carry 2150 third-class passengers, besides freight. The work will be completed in about three months and, when ready for service, the ship will be placed on the New York-Hamburg run with the MANCHURIA and

MONGOLIA. MINNEKAHDA was built in Belfast, Ireland, in 1917, for the Atlantic Transport line. Her acquisition by the American line is in anticipation of the heavy emigrant travel from and through Germany that is expected to follow ratification of the peace treaty. Few American vessels suitable for this trade are available, as a majority of ships offered for sale by the government are under 10,000 tons.

The MINNEKAHDA is the largest vessel ever transferred from British to American registry, and is the first steamer of more than 10,000 tons to be so transferred since the CITY OF NEW YORK and the CITY OF PARIS, now the NEW YORK and PHILADELPHIA, respectively, which came under the American flag in 1893, by authority of a special act of congress. The present transfer will be made at an early date under provisions of the Panama canal act of 1914 and the merchant marine act of 1920.

The MINNEKAHDA is 620.5 feet long, 66.4 feet breadth and registers 17,221 tons gross. She has triple screws, with two reciprocating engines and one low pressure turbine. She is a coal burner.

Will Have Marine Show

Plans have been completed for holding a marine exposition in Philadelphia at the First Regiment armory the week of March 14, 1921. Exhibits representing practically everything that goes into the building and furnishing of ships, shipyards, etc., are planned. Motion pictures will be shown every day and night illustrating shipbuilding and American ships in domestic and foreign waters. Lectures will be delivered in conjunction with the moving pictures. Each night will be known as a special night for one of the various shipyards of Philadelphia and vicinity including the Philadelphia navy yard and Hog Island.

Estimates by the British board of trade show that net earnings of British shipping this year will amount to approximately \$2,000,000,000, which sum the board asserts will not only offset Great Britain's excess of imports over exports for the year, but will give the kingdom a favorable balance of \$1,000,000,000.

Arrangements have been completed for organizing drydock and ship repair yard at Green Bay, Wis. The company is headed by C. Hartmann, formerly of the Hartmann-Greiling Co. Work on the drydock will be completed next year. A power house and stock of material, however, is available for use in repair work.

Readjustment Strengthens Yards

Stabilization of Shipbuilding Industry on New Basis Is Taking Place—U. S. Leads in Tanker Construction

STATISTICS of shipbuilding in the United States may be made to appear most discouraging to the American industry; but statistics as provided during the month past do not tell the whole story. According to the commissioner of navigation there were on Oct. 1 last 331 steel vessels, aggregating 1,236,277 gross tons, being built for private American shipping companies in American shipyards. On the other hand, the British yards had under construction on Oct. 1 a total of 3,731,000 gross tons of ships, or three times the tonnage building for private account in American yards. It was reported also that German yards had started work on some 23 ships and that the old German lines are rapidly drafting plans for the upbuilding of their fleets.

There is, however, a much better way to measure the comparative standing of the countries in question. American shipbuilding, according to current figures, represents an increase of 1097 per cent over the construction in American yards prior to the war, whereas Britain's advance during the same period has been but 116 per cent. Lloyd's acknowledges American yards are leading the world in the building of oil tankers and likewise that they are building larger ships on an average. Construction in Canada is showing a decrease.

Prospects Are Better

Today, much better prospects exist for a healthy shipbuilding industry in the United States than a month ago. The political campaign is over and, to that degree, uncertainty regarding the national shipping policy is being clarified. Many important steamship companies have hesitated in taking any steps toward developing their business until assured of the political outcome. Promise of a healthy and vigorous federal campaign to promote shipping under the American flag, means the American yards may hope for more business.

It is increasingly evident that American bankers are interesting themselves in this matter of shipping. Only recently, the Guaranty Trust Co., of New York, published an analysis of the bearing that American ships have upon our foreign commerce. This statement makes an analysis of the "invisible" revenue derived by England from her merchant marine,

which would indicate that British shipping will soon have brought in sufficient return to restore England to her former position of a creditor nation.

"The American carrying trade to and from United States ports," declared the Guaranty Trust Co., "showed a steady increase in tonnage during the fiscal year ended June 30, 1920, but, during the same period foreign carrying trade to and from our ports increased at a more rapid rate than our own trade, with the result that American ships in July carried less than 50 per cent of our total foreign commerce. American ships carried about 57 per cent of our July trade with North America, about 55 per cent of our trade with South America, and less than 30 per cent of our trade with Europe.

"The way has been opened for increasing the importance of the United States as a maritime nation. For 60 years a large proportion of the profits of American industries has gone overseas in the form of ocean freight charges, marine insurance premiums and banking commissions, and the toll has aggregated billions of dollars. From 1870 to 1890 alone, foreign shipowners collected more than \$3,000,000,000 from us. In the year before the war the bill amounted to nearly \$400,000,000, and last year, it is estimated, we paid more than \$700,000,000 to enrich our competitors on the high seas."

When responsible American institutions show a willingness to incur an expense to distribute such views, it should at least be taken as a clear indication of the desire of the larger American interests to continue the building and strengthening of American shipping. The daily press has been filled with many accounts of cheap sales of foreign ships, which give an invidious comparison with shipbuilding costs in the United States. But it is understood many of the cheap foreign sales have been foreclosures and a result of readjustments of interests. The fact American yards are today holding many contracts to build tankers for British account would seem to disprove the theory that they cannot compete with the British builders.

Although contracts captured during the past month may be negligible, it is no indication the competitive power

has been lost. As a matter of fact, unnamed Norwegian shippers last month awarded contracts to the Norway Pacific Co., Everett, Wash., for six 12,000 deadweight ton tank steamers, the first of which is to be delivered next August. Swedish owners also are seeking tonnage.

It is said that about 40 per cent of the shipbuilding ways in the United States are now idle, but even that is no assurance that the industry is unhealthy. Many building ways were erected during the war period and the building capacity expanded far in excess of anything this country normally would need. It was a condition well recognized by shipbuilders at the time and the fact that only 60 per cent of the ways are busy today is no proof that the outlook is pessimistic.

Costs Are Decreasing

As a matter of fact, the gradual decline of American shipbuilding to a normal basis is bringing about a much desired stability in the industry. While this is in progress, American builders are exerting all efforts to reduce the cost of building. They have so far met with considerable success in this direction. Shipyards in the New York district report a somewhat larger turnover of labor but point out that, on the other hand, many applications for employment in all classifications are to be found at the gates of the yards each morning. The situation in the New York district is unusual inasmuch as a heavy amount of ship repair work is in progress.

The striking machinists at the yard of the Consolidated Shipbuilding Corp. Morris Heights, New York, have voted to return to work. No concessions were made by the company. The strike hinged upon a demand for an increase of 25 per cent in wages. Indications are that the strike at the plants of the Newburgh Shipyards, Inc., and the Tank Shipbuilding Corp. soon will be broken, as the men gradually are returning to work at the previous scale. The strike of painters in the ship repair yards has continued without change, except the employers have taken a decided stand against the strike and have been employing non-union painters exclusively to carry on the work.

Conditions are gradually becoming such that the American shipbuilder can foresee the time when he will have

some authority over his own property and when the costs of ship construction will be stabilized. The reputed slump in building throughout the country has been largely conducive to this and the lack of new contracts from shipowners is not giving the concern it otherwise would.

The Staten Island Shipbuilding Co. has secured several large contracts. It will install eight compound engines in four ships of the Mexican Petroleum Co., which were propelled formerly by electricity. Two new boilers will go aboard one of these ships. The yard now is proceeding with the conversion of two bulk freighters belonging to the Standard Oil Co. of New Jersey, by installing two longitudinal bulkheads and five athwart bulkheads in each ship. The Standard Oil Co. of New York has placed a contract with the Staten Island Shipbuilding Co. for constructing three bulk oil barges of carfloat type, making contracts for 13 barges concluded between these principals during the past year.

The plant of the Maryland Shipbuilding Co., at Sparrows Point, Md., has been purchased by the National Ship Supply Machinery Co., of New York. The purchase included all the ship machinery stored at the plant by the Emergency Fleet corporation. The New York Shipbuilding Co. has launched the tanker *NORA* for the William R. Grace Steamship Co. This yard has completed the *OLD NORTH STATE*, the second of the combination passenger and freight steamers built for the Emergency Fleet corporation.

The first of the four bulk oil steamers to be constructed for the Standard Transportation Co., New York, at the Fore River plant of the Bethlehem Shipbuilding Corp., is called the *CHINA ARROW*. The *AGWISEA*, the first of three 12,600-ton tankers being built for the Atlantic, Gulf & West Indies Steamship lines, has been launched at the Sparrows Point plant of the Bethlehem corporation. This plant, it is reported, is making a record in progress on two tankers being built for the Lux Navigation Co., of London. The Moore plant of the same shipbuilding company has launched the *IRORORE*, the first of two steel refrigerating ships building for the International Products Steamship Co., a subsidiary of the International Products Co.

The 8800-ton standard steamer *JOHN STEVENS* built by the Merchant Shipbuilding Corp. for the Emergency Fleet corporation has been delivered. A similar ship called the *GEORGE E. WEED* has been launched at the Chester yard of this company.

Pusey & Jones have completed the steamship *NORWALK*, which was built

for the Eastern Steamship Lines, Inc. The *WILLIAM PENN*, built at this yard, has been sent to the yard of the William Cramp & Sons Ship & Engine Building Co. to be equipped with two diesel engines. The *EL ESTERO* built for the Southern Pacific Atlantic Coast Steamship lines has been completed by the Downey Shipbuilding Corp. The *EL LAGO* is nearing completion in the same yard.

Delivers Modern Freighter

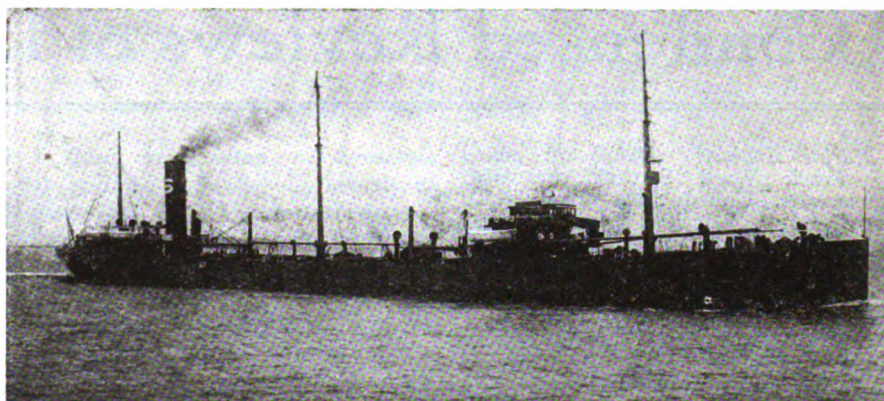
The Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass., has just completed and delivered to the Standard Transportation Co. the single-screw tank steamer *CHINA ARROW*.

This ship is 485 feet long, 62 feet 6 inches beam, 39 feet 6 inches depth and about 26 feet 6 inches draft. She

\$85,000. The *EASTERN SWORD* was converted from a coal to an oil burner and also had other interior changes made.

The same yard has completed its contract on the steel steamer *ELIHU THOMSON* since renamed *ROSITA* and sold to Peruvian interests. This craft also was changed to an oil burner and extensively overhauled. The shipping board steamer *ELLSTON* was in drydock for nearly two weeks having a new stern frame installed and other repairs made. The *WESTWARD HO* was equipped with new turbine engines at the Todd yards. In addition to these larger contracts, repair work on small craft is keeping the Todd docks and yards busily occupied.

Marine insurance interests have been hard hit by the mishap to the express coasting steamer *PRINCE RUPERT*, which was beached in British Columbia waters



TANKER CHINA ARROW

New oil carrier built by the Bethlehem Shipbuilding Corp. for the Standard Transportation Co., which had her trial trip in October

has a 4-cylinder, quadruple expansion, reciprocating engine equipped with surface condenser. She has cylinders of 24, 35, 51 and 75 inches diameter, with a common stroke of 51 inches. There are three Scotch boilers, 15 feet 3 inches in diameter and 11 feet 6 inches in length with a 220-pound pressure.

The ship is of the shelter type built on the Isherwood system with straight stem and elliptical stern with bridge houses amidships and aft around the engine and boiler casings. There are three steel pole masts and 10 double main cargo tanks with a combined capacity of 3,665,700 gallons are provided.

The *CHINA ARROW* is the first of the four bulk oil steamers to be constructed for the Standard Transportation Co., New York, at the Fore River plant.

Coast Shipyard Is Busy

The last Japanese-built steel steamer delivered on the Pacific coast, the *EASTERN SWORD*, has just come from Todd Dry Docks, Inc., yard ready for service. The Seattle yard was awarded the contract for this vessel on a bid of

after striking an unknown obstruction. It was possible to beach the vessel but she lies in such a position that salvage operations will be difficult and expensive. It is estimated the work will require three months and will cost at least \$300,000.

Union Shipyard Improved

The Union plant of the Bethlehem Shipbuilding Corp., at San Francisco, known for 35 years as the Union Iron Works, is making waterfront improvements and has acquired recently a new 12,000-ton floating drydock. The additions will increase materially the company's construction and repair facilities.

The new drydock was purchased from the Ames Shipbuilding Co., Seattle, just prior to its completion by that company. It was towed down to the Union plant on San Francisco bay and now is in operation. It consists of four sections of 3000-ton capacity each; each section being 90 feet long and 126 feet wide, both end sections having an apron

of 27 feet, the interval between the sections being 2 feet 6 inches or a total length over aprons of 421 feet 6 inches. It has a depth of 27 feet over the keel blocks and with the exception of a few battleships now on the Pacific coast it is able to handle all ships that normally come into the harbor of San Francisco.

To concentrate its floating drydocks, the No. 3 dock will be moved from the Alameda works to the Potrero works. This will give the Potrero works four floating drydocks. The Alameda plant will have two marine railways and the Hunter's point plant will have two graving docks. The graving docks are cut out of solid rock and lined with concrete. No. 3 graving dock at Hun-

ter's point is one of the largest in the world. It is designed to receive any ship capable of passing through the Panama canal, being 1029 feet long, 153 feet wide at the top and measuring 110 feet wide at the bottom.

The relation between wharfage and drydockage has always been maintained and is now being increased due to the purchase and addition of the new docks. New wharfage construction will provide an additional 60,000 square feet of wharfage all of which has been designed to carry a load of 500 pounds per square foot. The lineal mooring capacity will be increased by approximately 2500 feet giving six additional berths or a grand total of 21. At the Alameda

plant, the present bulkhead wharf will be extended 400 feet making it 1300 feet in length. At Hunter's point, the wharf at the entrance to No. 2 dock will be entirely reconstructed. These new piers are being built throughout of creosoted piling. In addition to its drydocks and wharves, the Union plant has 70 modern fire-proof buildings of 1,500,000 square feet of floor space all equipped with modern machinery, three shearlegs, three work barges, tugs and launches and the largest stock of material carried by any shipbuilding plant on the Pacific coast. Besides its record in the construction of merchant and naval vessels it has repaired or dry-docked not less than 2500 vessels in the past 32 months.

Condensed Reviews of Latest Books

Marine Engineers' Handbook: edited by Frank Ward Sterling, lieutenant commander, United States navy; 1500 pages, 4½ by 7 inches; flexible covers; published by the McGraw-Hill Book Co.; for sale by MARINE REVIEW; price \$7, prepaid.

This book, prepared by a staff of specialists and edited by a naval officer of wide experience and extensive training, promises to become one of the standard works for marine engineers. Inasmuch as it is the combined work of about 30 recognized authorities, each providing the subject matter dealing with his particular line, it is relieved of the narrow, single point of view, which is a weakness of many handbooks of this sort.

It is complete in every respect, as its 1500 pages cover the field of marine engineering in a comprehensive way, from logarithms to electric drives for war and commercial vessels. **Every subject, between these two extremes, is exhausted in condensed form.** The many illustrations aid the text and bring it well within the grasp of everyone at all acquainted with the subjects.

Mathematical formula, nonferrous metals, heat, fuels and combustion, boilers, turbines and reduction gears, reciprocating and diesel engines, vacuum and condensers, ship forms and propellers, auxiliary machinery, piping, electrical installation, lubrication, measuring horsepower, tests and inspections are among the many subjects treated in this book.

Of particular interest, owing to their timeliness, are the chapters on turbines and electric drives. The navy

pioneered in both these fields and Lieutenant Commander Sterling took a prominent part in the experimental and development work incident to the establishment of these advanced types of motive power aboard ship.

* * *

Building the Emergency Fleet, by W. C. Mattox; 300 pages, 6 x 9; cloth; numerous illustrations, portraits and charts; published by the MARINE REVIEW, Cleveland; price \$5, prepaid.

America's great industrial power was mobilized with crushing force to back up the army on the western battle front. The response made by the United States to the insistent calls for hugely increased production of commodities of all kinds was sufficiently clear and conclusive to bring to Germany a realization of her futile efforts to defeat the allied armies. In this brilliant record of accomplishment, no industry took a more striking and effective part than the shipbuilding field.

After Germany's crushing defeat at the Marne, her closest approach to victory came through the sinking by submarines of the ships carrying food and war supplies to Europe. Concurrent with the rapid development of ship construction in the United States, the prospects for the success of the submarine campaign became more remote. American shipyards furnished an answer in the form of fleets of new steamships that led Germany to an appreciation of the hopelessness of her situation. The negotiations held in the hours immediately preceding the armistice resulted to a

small but highly important degree from the record-making work of the American shipyards.

For these reasons, the full and authoritative description of the construction of this great war fleet is one in which every American can find interest and profit. Mr. Mattox has written the first authentic account of the history of war shipbuilding. The position which he formerly held as head of the publications section of the Emergency Fleet corporation gave him ideal opportunities for obtaining a broad and intimate view of the work of this government department in placing at the country's disposal the fleet which was required for winning the war. The author has used the training of his earlier work for studying the innumerable activities of this largest shipbuilding organization. His observations, as given in the book under review, show clearly the corporation's activities, the problems which had to be overcome and the methods which were developed to vitalize its war program.

The book traces the work of the corporation from its organization up to and through the first post-armistice year. The author was in close personal contact with the men charged with the work of defeating the submarine campaign and he uses the opportunity thus offered to show the extent of the problems faced by the organizers of the Emergency Fleet corporation. The development of the various agencies organized to carry out this work of shipbuilding, the early problems of organization which

had to be ironed out and the final whipping into form for efficient ship production are records of accomplishments which make up the bulk of the book. In this intimate study of the work of each branch of the corporation, the book will prove of great interest to the large number of persons associated with war shipbuilding not only with the Emergency Fleet corporation but in all private shipyards.

For the general reader, the book has much additional value. Aside from its historical character the story told by Mr. Mattox is one of corporate organization and management which yields value and suggestion to any engineer, even in industries not allied with the marine field. To strengthen this phase of the work, a special chapter was written by Howard Coonley, president of the Walworth Mfg. Co., Boston, who served as vice president in charge of administration of the Emergency Fleet corporation. The work assigned to Mr. Coonley was to obtain order and efficiency from the great mass of administrative employes which had been built up by the Emergency Fleet corporation in Philadelphia and Washington and in every shipbuilding center. Charts are included to illustrate the methods employed by Mr. Coonley.

In an especially prepared chapter for this book, Charles M. Schwab, director general of the corporation, furnishes his own observations on the problems of the corporation and the reasons for its failures and successes. Charles Piez, vice president in charge of construction, who succeeded Mr. Schwab as head of the corporation, has contributed a chapter containing the results of his studies of the policies essential for developing a permanent American merchant marine.

The book is more than a historical review of the war activities of a federal department. It is a story of a successful American business enterprise, which encountered and overcame problems common to most industrial organizations.

* * *

Applied Naval Architecture: W. J. Lovett, vice president of the Engineering and Scientific Association of Ireland; 650 pages, $5\frac{1}{2} \times 9$ inches; 350 tables, diagrams and illustrations; published by Longmans, Green & Co.; for sale by MARINE REVIEW; price \$12, prepaid.

This is a technical book for the naval architect by a man who has had a wide experience both in practice and in instruction. As a lecturer before the Belfast Municipal Technical institute, he acquired the faculty

of presenting technical data in an understandable way. This ability reveals itself in his book and makes it particularly suited to those just reaching the higher rungs of the naval architectural ladder.

Since specialization has become the rule in naval architecture as well as in other technical activities, the author states in his introduction that his book is intended primarily to cover the problems met with in the design and construction of moderate speed merchant vessels of 350 feet in length and upward. The book proceeds upon the theory that the reader is well advanced in his art and, therefore, wastes little time in explanations of the simpler subjects. It is veritable mine of data, arranged in tabular form so as to be quickly accessible for use. It is difficult to find a phase of shipbuilding and design, which the book does not cover in condensed, statistical form. The explanations of the method of making practical use of these data, form a valuable part of the book.

* * *

Diesel Engine Design: By H. F. P. Purday; 300 pages, $5\frac{1}{4} \times 8\frac{1}{4}$ inches; cloth; 271 illustrations; published by D. Van Nostrand Co.; for sale by MARINE REVIEW, \$7.50 prepaid.

This book is based upon about 12 years of experience with diesel engines, in fact, practically since their advent commercially. It is treated mainly from the draughting office point of view and covers the considerations which control diesel engine design. To technical students and diesel engine users, however, the book should appeal also.

Some of the specialized types, such as the stepped piston and opposed piston types, which are the product of few manufacturers, have been given less attention in favor of the more general types, which form the bulk of diesel installations of the present day.

The book exhausts the subject, however, of the common two and 4-cycle types. Dimensions of the various parts and the method of calculating them are one of the book's features. Methods of water-cooling pistons is another advanced subject treated at considerable length. Designs of fuel-oil mixing valves form an interesting chapter for designers.

* * *

Spot and Arc Welding: By H. A. Hornor; 296 pages, $5\frac{1}{4} \times 7\frac{1}{2}$ inches; cloth; published by J. B. Lippincott Co.; for sale by MARINE REVIEW, \$3, prepaid.

Although electric welding has been used for many years in repair work, a hesitancy to apply it to new con-

struction, especially to the joining of heavy steel parts, has existed. The purpose of this book, it states, is primarily to dispel this apprehension. The arc-welding and spot-welding processes both are treated with the object of clarifying the uses and possibilities of each method.

As an indication of the practical nature of the work, the entire data of tests made by the Emergency Fleet corporation are given in full. In this way the author states he hopes many may be able to adapt welding to their own manufacturing with great advantage.

Of particular interest, of course, is the application of welding to ships. The making of repairs by welding has been practiced for some time but the welding processes were considered to be limited to that sort of work. The Emergency Fleet corporation, however, established feasibility of welding for ship construction. Boats have been built successfully by the welding process. Their operation has proved the entire practicability of the "rivetless" ship.

This book by Mr. Hornor goes into every phase of welding—not in a theoretical way, but in a practical manner based upon actual results. It is profusely illustrated, which greatly aids in a grasp of the matter treated.

* * *

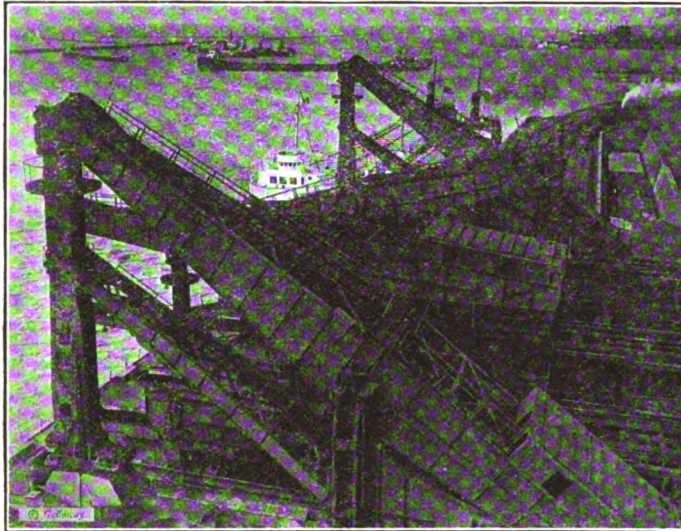
Handbook of Admiralty Law: By Robert M. Hughes; 575 pages, 6×9 inches; cloth covers; second edition; published by the West Publishing Co.; for sale by MARINE REVIEW, price \$4.50 prepaid.

The avowed object of this book is to bring the field of admiralty law up to date, thus keeping pace with the many changes which have been made both in statute and by judicial decision in recent years. It has the general practitioner in mind, rather than the student; but it is a book anyone engaged in shipping might well study with profit, particularly if intimately connected with operations and desirous of being properly posted with reference to his duties.

Much of the original edition has been discarded. Various points, also, are considered in the light of recent legislation, some of which has completely altered the relations between owners and crews, both native and alien.

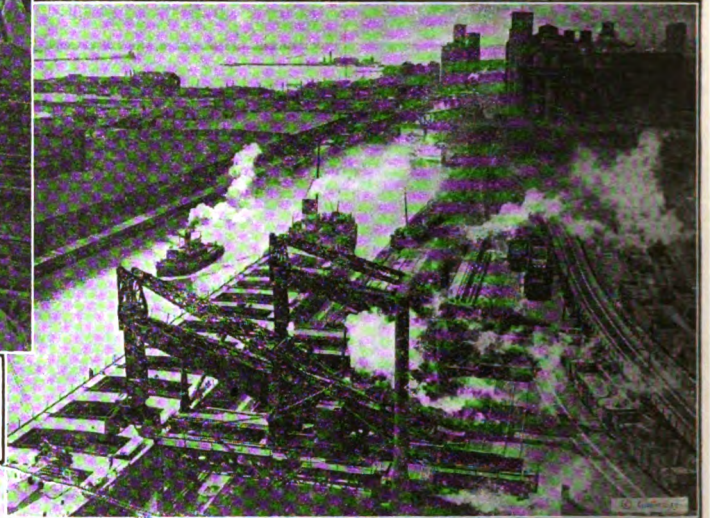
The chapters on general average and marine insurance; stevedore's contracts, tolls and towage; and contracts for freight and charter, especially, are of interest to the shipper who wishes a quick reference as to general conditions, according to law, under which he must operate.

Latest Marine News in Pictures



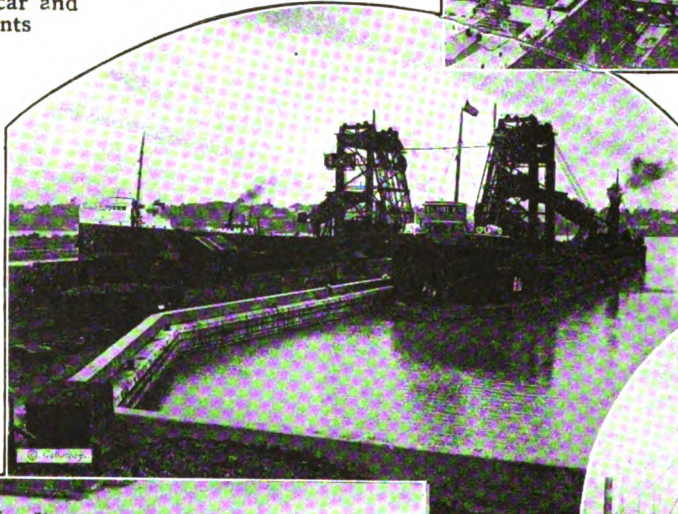
A glimpse of the huge coal handling machines at the Hocking Valley railroad docks, Toledo, O., loading two boats at one time. These machines pick up a coal car and dump its contents into the chute

Port facilities of the Great Lakes are thoroughly modernized. Here is a striking picture of the huge ore unloaders at one of the docks at Cleveland. These hoists take ore from the hold of a big steamer and put it direct into railroad freight cars

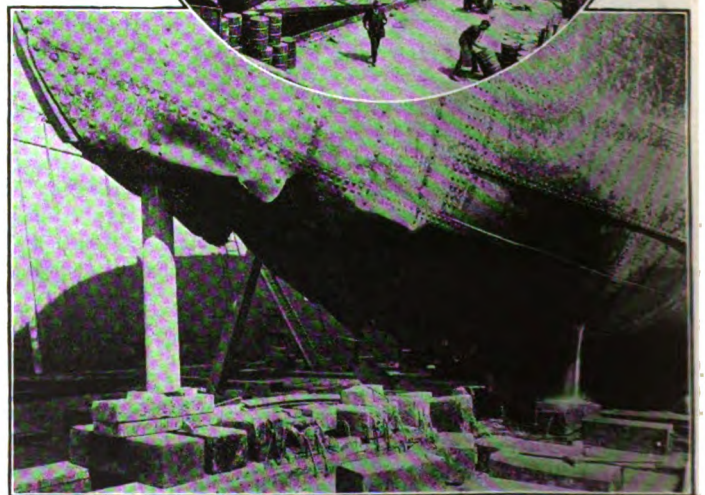


Buffalo like the other Great Lakes ports is interested in the proposed St. Lawrence canal. Above, is a picturesque view of the Buffalo harbor showing the great ore unloading docks and towering grain elevators

Airplane view of the Robins Dry Dock & Repair Co.'s yards, Erie basin, Brooklyn, N. Y.



Damaged forefoot of the steamer Willdomino. The injury was sustained in striking an uncharted rock off Canso, N. S. The small view shows the Willdomino on the dock for repairs at the Tietjen & Lang Dry Dock Co.'s yards, Hoboken, N. J.

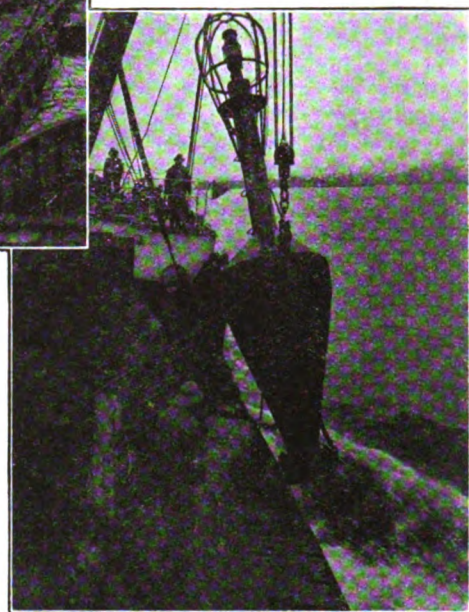


Photographs from Far and Near

On board the tender, the last duty is to adjust the delicate flashing mechanism of the light, preparatory to dropping it overboard and anchoring it in position

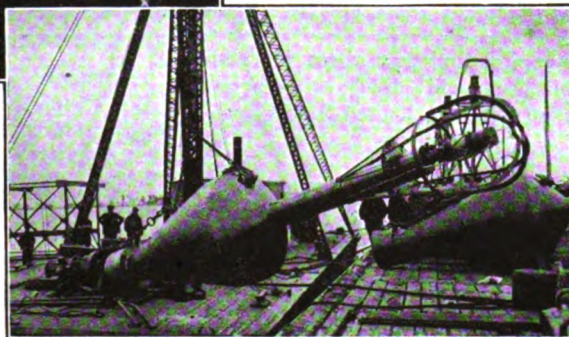


Laying buoys in the St. Lawrence river, where the current sometimes runs 10 knots an hour is a difficult task. Above is shown a group of gas-buoys charged and ready to be placed



An idea of the speed of the current in some of the narrow channels may be gained from the view above. The buoy is about to be dropped

The buoy in the foreground weighs 4 tons and is about 30 feet in length



Final inspection of the lighting apparatus before the buoy is left to the mercy of wind and wave



Lifting a buoy over the side when the tender is rolling as often is the case, is a task requiring skill and is attended with considerable danger

Marine Business Statistics Condensed

New York Traffic

Clearances from New York showed a decided increase during the month of October, which would indicate one of two things, either that the freight movement in better or that bunkers are more reasonable. It would appear that both factors have been at work. There has been strenuous competition for business and coincident with the decrease in freight rates business develops.

The entrances for the month showed the nominal increase. Of the 526 ships entering 251 brought general cargoes, 154 brought bulk cargoes and 121 entered in ballast. The clearances were the largest for any month this year, representing an increase in total tonnage of approximately 12 per cent over the month previous.

Bunker prices were fairly well maintained during the month although these showed a decided weakness

NEW YORK PORT TRAFFIC 1920
(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
January	372	1,145,136	410	1,450,774
February	377	1,174,913	330	1,054,269
March	440	1,322,013	410	1,369,829
April	431	1,302,177	386	1,243,000
May	444	1,343,052	390	1,258,996
June	508	1,545,144	436	1,364,297
July	510	1,627,721	462	1,518,406
August	537	1,634,719	499	1,649,418
September	506	1,728,266	493	1,574,228
October	526	1,763,904	514	1,719,103

*Corrected.

early in November. At that time bunker coal dropped to \$19 a ton, alongside. A month previous spot bunker coal had been quoted at \$16. Fuel oil also showed a slight decline, but it was not nearly so pronounced. Early in November fuel oil, 16 Baume, was quoted at 7½ cents per gallon, New York, which was 1½ cents per gallon less than the price at which it had been selling a month previous. Diesel oil, 58 gravity, held firm at 15 cents per gallon.

Philadelphia Traffic

Freight movement through the port of Philadelphia declined during the month of October. This was due in part to the cessation of the sugar imports and the slowness of the grain and flour exports, but more especially resulted from the fact that bunker costs at the port did not decline in anything like the proportion that they did at New York. During the first week in November, vessels were clearing the port of Philadelphia with bunker coal that cost them from \$15

to \$16 a ton. Some left with only sufficient bunker to carry them to Norfolk. On vessels clearing at the same time fuel oil bunker had cost 11 cents a gallon.

The city of Philadelphia plans entering into a contract with the fed-

PHILADELPHIA PORT TRAFFIC 1920
(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
January	59	139,941	67	199,396
February	67	184,753	72	230,768
March	91	223,082	65	171,724
April	88	205,694	89	237,730
May	129	316,246	126	315,997
June	106	251,070	75	181,975
July	92	226,945	86	253,357
August	134	336,802	145	404,867
September	133	360,138	147	449,818
October	107	299,511	157	446,010

*Correction.

eral war department to take over the army piers at Oregon avenue. Under this arrangement the city would main-

PHILADELPHIA PORT TRAFFIC 1920

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
July	104	250,164	93	272,913
August	153	377,695	156	438,230
September	144	385,676	153	467,357
October	119	328,074	165	465,800

tain the piers and rent them for commercial uses and divide the profits therefrom with the United States army.

Suez Traffic Declines

The effect of the Panama canal as a relief for the traffic through the Suez canal is convincingly shown in figures just obtained by the MARINE REVIEW. A steady decline in tonnage has been shown since 1912, or since the American canal has been in operation.

The largest year's traffic of Suez was in 1912, when 5372 ships were locked through, carrying an aggregate of 20,295,120 tons of cargo. This total has shrunk until, in 1919, but 3986 boats passed with 16,013,802 tons of cargo. Movement for the various years was:

Years	Ships	Net tons
1912	5373	20,275,429
1913	5085	20,033,180
1914	4892	19,409,465
1915	3702	15,266,155
1916	3110	12,325,347
1917	2353	8,368,813
1918	2522	9,251,601
1919	3986	16,013,802

Sale of the equipment of the Housatonic shipyards at Stratford, Conn., has recently been announced. The shipyard equipment, which was used during the war to build six government freighters, is valued at \$175,000.

Boston Traffic

Entrances and clearances of vessels engaged in the foreign trade at the port of Boston during July were as follows:

VESSELS ENTERING AND LEAVING BOSTON PORT DURING 1920

(Offshore Trade Only)
Foreign Registry

Months	—ENTERED—		—CLEARED—	
	No. Ships	Net Tonnage	No. Ships	Net Tonnage
January	26	66,829	17	54,203
February	23	68,344	8	19,227
March	24	80,755	15	39,079
April	38	111,719	21	43,726
May	31	60,204	28	34,472
June	58	109,204	44	49,906
July	62	113,337	56	53,820
August	85	122,019	59	55,394
September	64	107,212	52	49,801
October	50	97,841	41	56,652

American Registry

Months	—ENTERED—		—CLEARED—	
	No. Ships	Net Tonnage	No. Ships	Net Tonnage
January	27	74,297	23	49,203
February	23	55,878	16	36,296
March	36	84,031	21	48,438
April	46	68,777	47	74,468
May	54	64,466	53	52,964
June	62	88,932	44	74,688
July	49	99,617	31	70,879
August	48	113,687	24	69,249
September	35	103,284	23	73,244
October	32	84,187	21	60,885

October Ore Shipments

Shipments of iron ore from the Lake Superior district in October aggregated 8,848,986 tons, an increase of 2,647,103 tons over the record of October, 1919. Shipments in that month were 6,201,883 tons. The lake fleet up to Nov. 1 had moved 53,122,342 tons against 43,978,414 tons to Nov. 1, 1919, an increase of 9,143,928 tons. Shipments by ports in October and up to Nov. 1 are shown in the following table:

Port	—Gross tons—	
	October, 1920	To Nov. 1, 1920
Escanaba	1,030,683	6,514,327
Marquette	482,495	3,117,097
Ashland	1,330,162	7,447,197
Superior	2,274,801	13,566,731
Duluth	2,432,465	14,089,331
Two Harbors	1,368,380	8,387,653
Total	8,848,986	52,122,312

Lake Michigan Receipts

Receipts of ore at Lake Michigan ports for October were 1,194,863 gross tons, as shown in the following record by ports:

Port	Gross tons
South Chicago, Ill.	711,076
East Jordan, Mich.	.....
Koyne City, Mich.	.....
Milwaukee	18,570
Indiana Harbor, Ind.	142,211
Gary, Ind.	323,046
Total	1,194,863

Marine Business Statistics Condensed

New Ship Construction

American shipyards today are further behind those of England in the amount of tonnage under construction than before the world war, declares Lloyd's in a statement based on returns to Sept. 30, 1920.

Even with the present reduced scale of output, however, the tonnage building in American yards represents an increase of 1097 per cent over the total of that building just prior to the war. The British gain for the same period has been 116 per cent. Compared with prewar figures, the American yards are building 1,624,000 gross tons more of ships and the British yards 2,009,000 tons more.

On Sept. 30, 1920, the tonnage under construction in American yards was 1,772,000 gross tons of the total of 7,565,000 tons building in all yards of the world. Of the total, British yards were constructing 3,731,000 tons. Other yards throughout the world had in process of construction 1,750,000 tons.

The United States leads the world in tanker tonnage building, no less than 79 being under construction on Sept. 30, 1920. The average size of its boats, also, is much larger than any other country. While Britain in building 912 ships of 3,731,000 tons, American yards are building only 280 boats; but their tonnage is 1,735,000 tons.

In other words, the average size of the American boats is 6197 gross tons as compared with 4074 tons for the British.

Soo Canal Report

During October, 2745 vessels with an aggregate net registered tonnage of 9,030,804 passed through the Soo canal. These vessels carried 13,000,299 net tons of freight. Compared with the freight movement for September, when 11,748,131 tons were handled, the figure showed an increase of 1,252,168 tons. The movement in October is 3,286,980 tons more than that in October, 1919, when 9,713,319 tons were handled. The total movement for the year up to Nov. 1 is 68,357,637 tons. When compared with the total up to Nov. 1, 1919, an increase of 5,455,783 tons is shown.

The October tonnage figures for the past seven years follow:

	Tons
October, 1920.....	13,000,299
October, 1919.....	9,713,319
October, 1918.....	19,368,287
October, 1917.....	12,646,066
October, 1916.....	9,116,196
October, 1915.....	11,557,851
October, 1914.....	7,740,005

Of the total freight carried in October, 12,700,739 tons were handled by the United States canal while 299,560 tons passed through the Canadian canal.

The following tabulation gives the

season's figures in detail for 1920 and 1919:

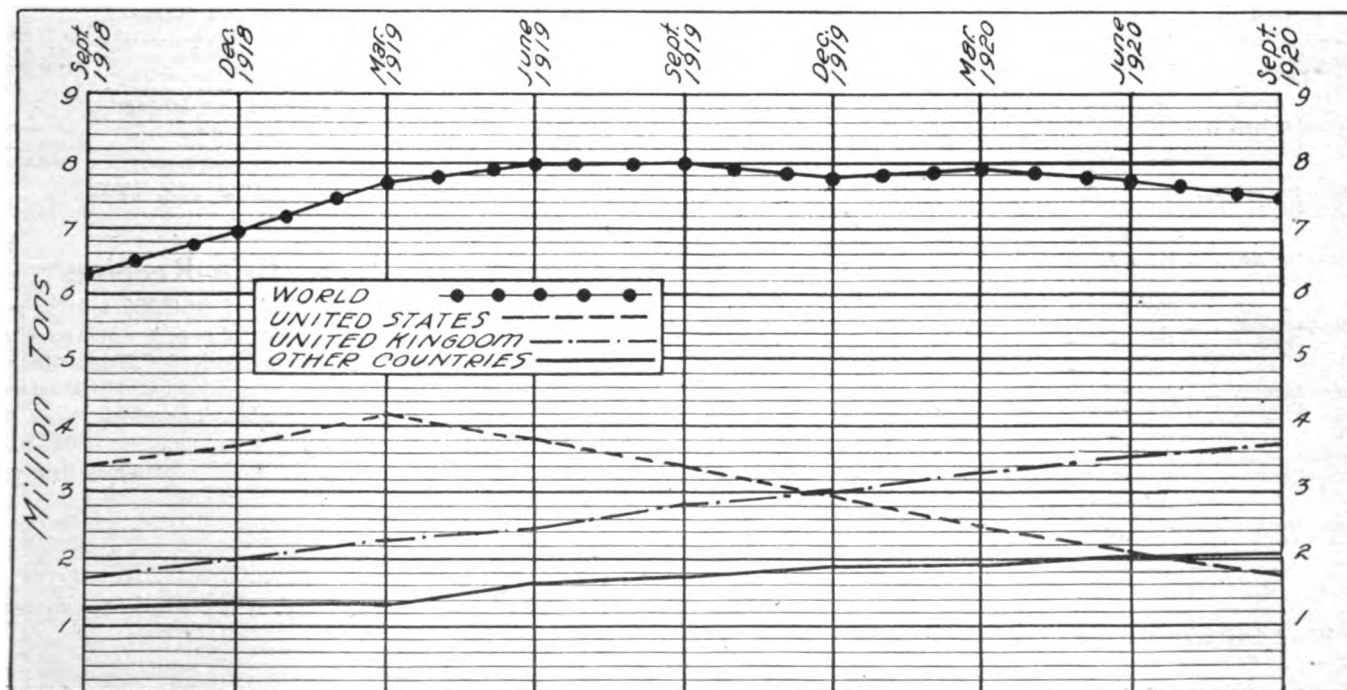
	To Nov. 1, 1920	To Nov. 1, 1919
Lumber M. feet B. M....	182,820	217,673
Flour, barrels.....	5,714,903	6,255,204
Wheat, bushels.....	79,194,895	88,539,419
Grain, bushels.....	36,740,337	39,896,715
Copper, net tons.....	40,854	51,313
Iron ore, net tons.....	50,951,942	43,445,065
Pig iron, net tons.....	462	3,773
Stone, net tons.....	65,344	51,862
Gen'l merch., net tons.....	41,055	90,577
Passengers, number.....	33,512	28,348

	WESTBOUND	
Coal, soft, net tons.....	9,911,045	11,154,721
Coal, hard, net tons.....	1,679,371	1,877,711
Iron ore, net tons.....	127,067	126,436
Mfg. iron and steel, net tons.....	60,889	104,860
Salt, net tons.....	93,340	83,877
Oil, net tons.....	314,134	335,094
Stone, net tons.....	463,367	309,913
Gen'l merch., net tons.....	422,636	389,455
Passengers, number.....	34,395	28,558

	SUMMARY	
Vessel passages, number.....	16,426	16,128
Registered tonnage, net.....	50,818,574	45,855,020
Freight—		
Eastbound, net tons.....	55,286,988	48,218,998
Westbound, net tons.....	13,070,649	14,382,106
Total freight, net tons.....	68,357,637	62,601,104

River Traffic

River tonnage of Pittsburgh harbor for the months of July, August and September of the current year was more than 1,000,000 tons greater than that of the Panama canal for the entire year of 1919. The tonnage of the Monongahela river for the first nine months of the present year increased nearly 33 1/3 per cent over that of 1919. For the first nine months of 1920 the movement was 17,364,068 tons



DISTRIBUTION OF THE SHIPBUILDING TONNAGE OF THE WORLD

Marine Business Statistics Condensed

as compared with 12,831,632 tons last year. The record for September in tons follows:

Items	Allegheny	Monongahela	Ohio
Coal	93,520	1,689,930	192,700
Coke	625	37,510	6,700
Gasoline	1,238	908	737
Gravel	134,759	125,587	17,100
Sand	141,076	101,793	20,895
Miscellaneous	1,744	47,205	34,645
Packet cargo			3,993
Total	333,679	2,002,833	276,033
Grand total	2,612,545		

Seattle Traffic

The record of traffic at the port of Seattle and in the Washington customs district, including months for which figures are now available, follows:

FOREIGN IMPORTS, EXPORTS AND TONNAGE

Passing Through Washington Customs District

1920	Imports	Exports	Total	Entered, Tons	Cleared, Tons	Total, Tons
January	\$29,964,035	\$15,883,758	\$45,847,813	242,653	280,827	523,480
February	40,708,726	15,889,197	56,697,923	276,702	266,873	543,575
March	46,392,720	32,786,040	79,172,760	302,678	282,694	585,372
April	32,713,226	25,158,134	57,869,360	280,959	243,328	524,287
May	38,291,480	12,299,371	50,590,851	291,641	249,354	540,995
June	28,549,857	18,392,975	46,942,832	297,591	268,389	465,980
July	20,886,360	16,057,896	36,944,256	276,721	316,101	592,822
August	25,854,981	11,355,885	37,210,866	288,631	310,535	599,166

SEATTLE PORT TRAFFIC 1920

Deep Sea Arrivals			Deep Sea Departures		
No.	Ships	Net tonnage	No.	Ships	Net tonnage
220	284,587	January	237	320,212	
220	302,158	February	236	306,467	
200	341,705	March	299	325,164	
328	331,921	April	348	334,540	
376	328,594	May	392	324,932	
353	332,668	June	433	346,849	
417	441,626	July	461	444,607	
438	371,148	August	393	368,327	
422	380,582	September	323	345,535	

WASHINGTON CUSTOMS DISTRICT

—Entrances—			—Clearances—		
	No.	Tonnage	No.	Tonnage	
Jan.—American ..	61	87,385	196	128,962	
Foreign	185	155,268	187	161,865	
Feb.—American ..	346	242,653	383	280,827	
Foreign	147	88,528	173	93,347	
Mar.—American ..	183	188,174	176	168,520	
Foreign	330	276,702	349	266,873	
Apr.—American ..	185	118,794	174	107,134	
Foreign	161	183,884	155	175,580	
May.—American ..	346	302,678	329	282,694	
Foreign	177	127,786	174	91,676	
June.—American ..	183	188,174	176	168,526	
Foreign	350	280,859	342	243,328	
July.—American ..	226	107,183	272	107,444	
Foreign	188	184,458	194	181,910	
Aug.—American ..	416	291,641	466	289,354	
Foreign	264	135,420	338	93,617	
Sept.—American ..	190	162,171	194	174,772	
Foreign	454	297,591	432	268,389	
Oct.—American ..	272	105,814	304	122,723	
Foreign	220	170,907	219	193,378	
Nov.—American ..	492	276,721	523	316,101	
Foreign	292	117,200	292	125,510	
Dec.—American ..	203	171,451	199	185,025	
Foreign	495	288,651	491	310,535	

Word has been received from Consul General Skinner at London that the British embargo on the exportation of tea has been removed

New Shipping Firms

New shipping enterprises launched in October show an indicated investment of no less than \$36,500,000. Of these new companies, 10 were capitalized at \$50,000 or more. The October record showed an increase of more than \$6,000,000 in the aggregate of authorized capitalization over that of September; and is the largest since June of the current year, according to the *New York Journal of Commerce*.

The indicated investment in shipping activities during the first 10 months of this year is \$562,423,000, a figure more than two-thirds greater than that rolled up in any year since the outbreak of the world war in 1914.

The following companies were incorporated in October:

American Transatlantic Lloyd, Inc., Del.	\$ 7,000,000
American Shipping Agency, Del.	100,000
American Transportation & Trading Corp., Del.	20,000,000
Aetna Steamship Corp., N. Y.	100,000
American Siberian Corp., Del.	4,000,000
Brazadeno Co., Del.	1,000,000
Black Star Steamship Co., N. J.	500,000
Dominican Steamship Co., Del.	300,000
Emerald Motor Ship Co., Del.	3,000,000
Mount Washington Steamship Co., Del.	500,000
Total	\$36,500,000

Panama Canal Traffic

September traffic through the Panama canal established a new high record for any single month's business in net tonnage and also in tolls charged. The latter passed the million dollar mark for the first time, reaching \$1,010,166.38. Whole cargoes handled in September with summaries for earlier months of the year, follow:

ATLANTIC TO PACIFIC

	No. of cargoes	Tons
Fuel oil	11	79,033
Coal	8	43,819
Case oil	3	28,741
Structural steel	3	20,531
Sulphur	2	9,800
Crude naphtha	1	10,000
Phosphates	1	6,613
Sugar	1	2,887
General and mixed	70	242,813
Total	100	444,217

PACIFIC TO ATLANTIC

	No. of cargoes	Tons
Nitrate	26	141,945
Cold storage food products	9	55,652
Lumber	4	21,848
Wheat	5	34,440
Flour	3	18,419

Barley	2	14,177
Ties	2	13,436
Canned Pineapples	2	5,861
Lubricating oil	1	9,410
Gas oil	1	8,571
Chrome ore	1	8,105
Railroad equipment	1	6,350
Crude oil	1	5,567
Sugar	1	3,134
General and mixed	55	218,425
Total	114	565,340

SUMMARY FOR SEPTEMBER

Number of commercial vessels through canal	253
Registered net tonnage of above	817,810
Vessels without cargo	42
Registered net tonnage of above	116,125

SUMMARY FOR AUGUST

Number of commercial vessels	266
Registered net tonnage of above	770,320
Vessels without cargo	38
Registered net tonnage of above	106,401
Total cargo	1,040,740

SUMMARY FOR JULY

Number of commercial vessels	225
Registered net tonnage of above	702,951
Total commercial cargo handled	886,814
Vessels without cargo	23
Registered net tonnage of vessels without cargo	102,653

SUMMARY FOR JUNE

Number of commercial vessels	201
Registered net tonnage of above	575,027
Total cargo handled (tons)	834,421
Vessels without cargo	20
Registered net tonnage of vessels without cargo	52,890

SUMMARY FOR MAY

Number of commercial vessels	224
Total cargo handled (tons)	974,819
Registered net tonnage of above	694,941
Vessels without cargo	25
Registered net tonnage of vessels without cargo	88,043

SUMMARY FOR APRIL

Number of commercial vessels	220
Registered net tonnage of above	672,169
Total cargo handled (tons)	855,563
Vessels without cargo	37

SUMMARY FOR MARCH

Number of commercial vessels	235
Registered net tonnage of above	678,270
Total cargo handled (tons)	894,516
Vessels without cargo	32

SUMMARY FOR FEBRUARY

Number of commercial vessels	208
Registered net tonnage of above	579,842
Total cargo handled (tons)	701,799
Vessels without cargo	33

SUMMARY FOR JANUARY

Number of commercial vessels	238
Registered net tonnage of above	632,154
Total commercial cargo handled	894,628
Vessels without cargo	45
Registered net tonnage of vessels without cargo	94,448

Lake Erie Receipts

Out of a total of 8,848,986 tons shipped from upper lake ports in October Lake Erie ports received 7,296,421 tons, as shown by figures compiled by MARINE REVIEW. The balance on dock Nov. 1 was 10,212,975 tons against 10,004,767 tons Nov. 1, 1919. Detailed figures are:

Port	Gross tons
Buffalo and Port Colborne	1,152,135
Erie	326,264
Conneaut	1,012,204
Ashtabula	2,104,498
Fairport	187,019
Cleveland	1,219,869
Lorain	606,382
Huron	210,330
Toledo	356,507
Detroit	110,403
Total	7,296,421

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

531

Marine News in a Personal Way

Intimate Gossip About What Leaders in the
Maritime World Are Doing

E G. McMICKEN and R. D. PINNEO have been appointed respectively passenger and freight traffic managers of the Admiral line, with headquarters in Seattle, thus rounding out one of the most efficient shipping organizations on the Pacific coast. In their new capacities, they will have jurisdiction over passenger and freight traffic respectively including both the foreign and domestic services. Both the new traffic executives are well known steamship experts and have been identified with Pacific coast shipping for many years. The appointments are the



E. G. McMICKEN

outgrowth of a reorganization of the Admiral line staff just completed by Vice President A. F. Haines in preparation for the increased traffic activities to result from entry of the company into the oriental field on a large scale early next year. At that time, the company will receive five new passenger and freight vessels from the United States shipping board for operation between Puget sound and the Far East. These vessels, 535 feet in length, are now being completed in eastern shipyards and the first, the *WENATCHEE*, is expected to be delivered at New York early in January. They will be operated by the Admiral line from Puget sound to Yokohama, Kobe, Nagasaki, Shanghai, Hongkong and Manila, with a

second service to Tsing Tao, Dairen and Vladivostok—establishing the only transpacific passenger service under the American flag that the Puget sound gateway has had in many years. The Admiral line is the largest steamship operator on the Pacific, its fleet numbering 125 vessels and travel routes extending from Nome, Alaska, to Corinto, Nicaragua, and from the Columbia river and Puget sound to the Orient.

N. KARFVE, former assistant general manager of the Pusey & Jones shipyard, has resigned his office with that company and set sail for a long vacation in Europe.

J. A. STECKSEL, formerly connected with the Norwegian-American line at New York, has become assistant general manager of the Seven Seas Mercantile Transport Co., New York.

DONALD F. JENKS, until Nov. 1, vice president of Frederick A. Kirk & Co., Inc., New York, resigned on that date to represent in New York the business of the American Shipping Corp., Jacksonville, Fla. The company operates a line of steamers to continental and South American ports.

C. W. WILEY, president of Todd Dry Docks, Inc., Seattle, and the Todd Shipbuilding & Construction Co., Tacoma, Wash., recently was presented with a handsome silver service and a beautiful ship's clock by his associate officials. The delegation was led by H. W. Kent, treasurer of the Seattle plant, and J. A. Eves, general manager of the Tacoma yard. The gifts were intended for use on Mr. Wiley's yacht *HOPESTILL*, which he recently brought out from the Atlantic.

MURRAY S. WEBBER, formerly with the Merchant Shipbuilding Co., Chester, Pa., has become associated with Seabury & DeZafra, Inc., consulting naval architects and marine engineers, New York.

SHOZO MURATA, Osaka, Japan, overseas traffic director of the Osaka Shosen Kaisha, and personal representative of K. Hori, president of the big oriental

steamship corporation, was in New Orleans in October on business with the J. H. W. Steele Co., agent for the Japanese line.

L. A. P. WARNER, general manager of the Mersey Docks & Harbors, Ltd., Liverpool, England, spent a week in New Orleans, late in October, as the guest of E. J. McGuirk, acting manager of the Leyland line.

W. O. HUDSON was re-elected president of the board of commissioners of the



R. D. PINNEO

port of New Orleans, at the annual meeting Oct. 26. W. A. KERNGAN was re-elected vice president, and RENO CLERC, secretary.

CAPT. N. B. KELLEY has recently been appointed pilot commissioner of Boston to fill the vacancy occasioned by the death of Capt Richard Banfield. Captain Kelley has been secretary of the pilot commissioners for the past three years.

ARTHUR B. LANE, formerly New England representative of the American Marine Paint Co. has resigned his connection with that concern to accept the position of district manager for the Goheen Corp., New York.

Italians Improve the Motorship

Ansaldo San Giorgio I, First of Fleet of Successful Carriers, Now in New York Trade

MC DONNELL & TRUDA, New York, agents for the Transatlantica Italiana, have placed in the New York service some motor ships of improved design. These vessels were built by the Gio. Ansaldo & Co., shipbuilders and engineers at Muggiana, Spezia, and Turin, Italy. The first of the vessels to arrive in New York was the **ANSALDO SAN GIORGIO I**. There are two sister ships bearing the same name but numbered II and III.

The **ANSALDO SAN GIORGIO I** started on her return trip on Sept. 16. At that time she had been in service 18 months and had given excellent results. The bunker requirements are extremely small and her fuel consumption is said to be unusually economical. This vessel, when first completed, left Genoa and went to Glasgow and returned. She then sailed from Genoa for Valparaiso and returned, after which she was put in the New York run. So excellent have been the results obtained from this vessel that the Italian line is building several similar boats in which are incorporated various improvements.

The engine room on the **ANSALDO SAN GIORGIO I** is unusually commodious. Fuel is carried in tanks abreast the engines. Auxiliary engines are placed on deck in a specially constructed house, the smoke stacks being utilized by these auxiliaries. On the new motor ships to be built for this line the auxiliaries will be electrically operated. The increased use of electrical appliances aboard these ships results not only on account of the speed that can be obtained, but because this equipment enables steamship companies to employ

fewer men in operating their vessels.

The **ANSALDO SAN GIORGIO I** measures 393 feet 1 inch in length over all, is 51 feet 6 inches molded breadth, 30 feet 2 inches molded depth, and has a loaded draft of 24 feet 7 inches. She measures 8100 tons deadweight, 5663 tons gross registered, or 3485 net tons. The vessel is driven by two sets of 2-cycle diesel engines, placed aft. She makes a speed of 11 knots. The boat has the highest class of the British Corp. register and of the Registro Navale Italiano. The cargo holds are designed to be free of obstructions, thus permitting better and quicker cargo handling. This was adequately demonstrated when she unloaded her miscellaneous cargo at the port of New York.

Chief interest in this ship lies in her diesel propelling machinery. This consists of two diesel engines of the 2-cycle, single acting type, each having four cylinders and four cranks. They develop 1100 shaft horsepower at 100 revolutions per minute. The cylinders measure 24.75 inches in diameter, the stroke being 35.45 inches. The maximum pressure is about 450 pounds per square inch, and the fuel consumption of heavy oil not more than 0.43 pounds per brake horsepower. The ship can carry sufficient fuel in her bunkers to drive her fully laden at a speed of about 11 knots per hour for a distance of 7175 nautical miles. Furthermore, it is said, these engines can run on a heavy fuel oil of 16 Baume.

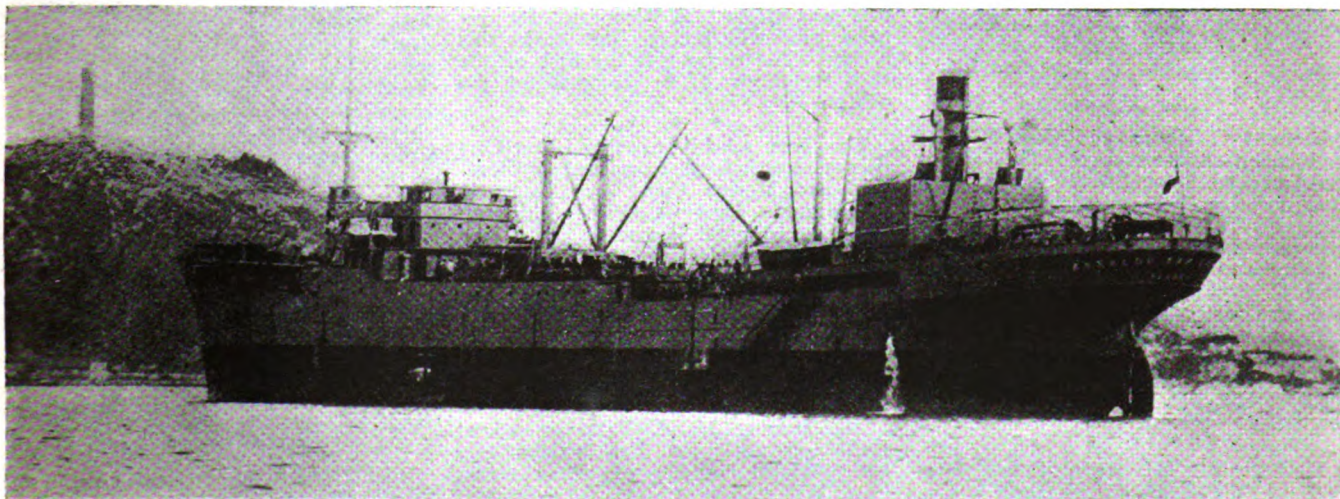
The auxiliary machinery, composed of a 3-stage air compressor, scavenging pumps, water circulating and bilge pumps, is driven from the forward con-

tinuation of the crankshaft. A complete set of pressure gages and controlling levers for the operation of the main and auxiliary machinery for starting and reversing the engine is arranged on a central control platform. The engine room auxiliaries consist of ballast pump, lubricating oil pumps, sanitary pumps, deck pumps, and fuel oil pressure pumps.

While in port, all of the auxiliary pumps are driven by steam supplied by two oil-fired vertical boilers, which are housed on the upper deck above the after end of the engine room. These boilers are 8 feet in diameter by 19 feet 6 inches high, having a working pressure of 100 pounds per square inch. While at sea, it is not necessary to fire the auxiliary boilers, the auxiliary pumps then being driven by compressed air furnished by the main engines. The location of this machinery gives an exceptionally light, airy, and spacious engine room.

Deck machinery is steam driven and is so designed and installed that cargo can be handled at a low cost. The cargo hatches, which are four in number, are unusually large and, therefore, the largest boxes or parts of machinery can be handled with the least possible delay.

The Transatlantica Italiana, which is improving its American freight services by placing these motor ships in the New York run, also conducts the well known passenger service between New York and Naples and Genoa. This is the line that operates the passenger steamers **GIUSEPPE VERDI** and **DANTE ALIGHIERI**. The line also operates the **HENRY R. MALLORY**.



MOTORSHIP **ANSALDO SAN GIORGIO I**

Italians embody many improvements in this new commerce carrier driven by internal combustion engines

Activities in the Marine Field

Latest News From Ships and Shipyards

Movement Heavy As Season Closes

BY H. C. MEADE

ORE shipments from the Lake Superior district for October were heavier than anticipated, being 8,848,986 tons as compared with 6,201,883 tons in the same month of 1919, and 8,541,593 in 1918. Carriers received better dispatch at Lake Erie ports than at any time during the season. At the rate the iron ore is being handled at the lower lake ports, the movement will take care of the requirements of the furnaces. A large number of vessels were dropped from the trade during the middle of November. The total ore movement for the season to Nov. 1 amounted to 53,122,342 tons against 43,978,414 in 1919, and 56,870,871 in 1918. Some of the ore that was sold for 1920 delivery will not be moved and will be carried over until next season. The car supply is fairly good at most ports and ore for direct shipment is going forward at a good rate. Approximately 5,176,569 tons of ore were shipped to interior furnaces from Lake Erie ports in October, as compared with 6,207,775 tons in September. Some wild ore is being offered but the demand for tonnage is light compared with a few months ago and little chartering will be done the rest of the season. Coal tonnage is offered rather freely and cargoes are taken about as fast as they are offered. The freight market is quiet and little chartering is being done. The grain trade is quiet and the demand for grain tonnage is light. Tonnage for late loading is offered freely.

The steamer MAUCH CHUNK which was recently purchased from the Lehigh Valley Transportation Co. by the Great Lakes Transit Corp. has been renamed the W. J. CONNERS, in honor of Chairman W. J. Connors of the Great Lakes Transit Corp.

Leonard C. Hanna and Capt. Charles L. Hutchinson were elected directors of the American Shipbuilding Co. at its annual meeting held recently at Jersey City, N. J. Officers were elected as follows: M. E. Farr, president; James E. Davidson, senior vice president; Alfred G. Smith and W. H. Gerhauser, vice presidents; John S. Gorman, treasurer and assistant secretary; L. B. Farr, assistant secretary; H. F. Pankhurst, assistant treasurer; Arthur G. Potter, controller; and H. A. Kelley, general counsel.

The steamer PATHFINDER has been sold by the Interlake Steamship Co., Pickands, Mather, & Co., managers, to the United Steamship Co. which was organized during the month. The ves-

sel has been taken over by the United company to engage in the grain trade.

Plans have been completed for lengthening the steamer F. B. SQUIRE 96 feet. The steamer will go to the shipyard of the Toledo Shipbuilding Co., Toledo, O., at the close of navigation where she will get new boilers and will have the upright stanchions removed and replaced with arches and will have her hatches made 12 feet fore and aft instead of 8 feet. The addition of 96 feet will make her 526 feet over all and her capacity will be 9500 tons.

The steamer LA BELLE put a hole in her hull 7 feet long and three to five inches wide while shifting at the Hanna coal dock at Duluth recently. The end of a railroad iron used as a fender to protect the concrete front of the dock caught the butt of a plate and after puncturing the side of the ship sheared off eight frames and punctured the collision bulkhead. Repairs were made at the Superior shipyards.

The steamer HENRY STEINBRENNER owned by the Kinsman Transit Co. is to be reconstructed at the yard of the Manitowoc Shipbuilding Co., Manitowoc, Wis., during the winter. She will get new boilers, new hatches, arches, tank top and side tanks.

The steamer GEORGE W. PERKINS went ashore on Ballard's reef recently, sustaining several damaged plates. Necessary repairs were made at Toledo, O.

The steamer PRINCETON, downbound recently with a barge in tow, got a line in her wheel in the St. Clair river. She was docked at Conneaut for repairs, and will not go out again this season. The steamer is the first of the steel freighters to be dropped for the winter.

The free schools of the Lake Carriers association will be opened at Cleveland and Marine City, Mich., early in the winter. Every student wishing to obtain an original license in the school in marine engineering and navigation, who completes the course and takes the examination will receive \$12 per week to help cover the cost of room and board for each full week of his attendance. The maximum in payments a student can receive will be \$120.

The steamer M. E. FARR arrived at Buffalo recently on her maiden trip with 445,000 bushels of wheat from Fort William.

According too a notice sent out by C. H. Hubbard, superintendent of

lighthouses, lights and fog signals will be discontinued for the winter season in the Straits of Mackinac, Lake Michigan and Green Bay on Dec. 1, at Petoskey; Dec. 5, at Mission Point; Dec. 10, at St. Helena, White Shoal, Squaw island, Ile Aux Galets, South Fox island, St. Martin island, and Poverty island; Dec. 20, at Seul Chooix Pointe, Beaver island, Little Traverse, Grand Traverse, North Manitou island, and Pottawatomie. Winter lights, illuminant acetylene gas, will be displayed after the close of the stations at White Shoal, Squaw island, Ile Aux Galets, North Manitou island, and Poverty island. Light vessels will be withdrawn from stations during the winter season about Dec. 1, at Eleven Foot Shoal, Dec. 7, at Grays Reef and North Manitou Shoal; and Dec. 10, at Lansing shoal. After the light vessels are removed their stations will be marked by regular station watch buoys (spars) which will be similar in color to the light vessels and will carry the first letter initial of the light vessel station under the letters "L. V."

The name of the steamer WILKES-BARRE has been changed to the EDWARD E. LOOMIS for President Loomis of the Lehigh Valley railroad.

The steamer CLIFFORD F. MOLL and C. S. ROBINSON collided on Lake St. Clair recently. The MOLL was damaged forward while the ROBINSON received slight damage.

The steamer SANTA VERONICO, the last of 35 boats to be constructed for the government under war time contracts sailed from the slip of the Toledo Shipbuilding Co., Toledo, O., recently. She went to Sault Ste. Marie where she loaded a cargo for New York parties. The vessel was purchased by the American-Cuban Steamship Co. which plans to use her in the Cuban sugar trade.

John W. Dougherty, formerly president of the Pittsburgh Crucible Steel Co., has been elected president of the Marquette Iron Co. and a director of Breitung & Co., New York, to succeed E. N. Breitung. The Marquette Ore Co. will handle the sales of the Marquette Iron Co. in the future instead of E. N. Breitung & Co., and will be located in the Kirby building, Cleveland.

Lights and fog signals south of North Manitou island on the east shore and south of and including Cana island on the west shore of Lake Michigan will be maintained during the winter

as long as they are required for navigation purposes.

The steamer SULTANA went ashore on Sugar island, Thunder Bay, in a recent fog. She was released after lightering part of her cargo. The lightered cargo was reloaded.

The recommended draft for the Soo and St. Clair rivers has been cut. Boats trading to Lake Erie can load to 19

feet 9 inches and from Lake Superior to Lake Michigan to 20 feet.

The steamer J. J. TURNER was stranded on North Twin island recently. She was released after lightering part of her cargo.

Capt. Olav Aslaksen, master of the shipping board steamer LAKE ELLENORA, which was built on the lakes, picked up the tank steamer AVONDALE, also of the

shipping board, about a year ago. The AVONDALE was stranded some 600 miles off St. John, N. F., and Captain Aslaksen stood by her for several days and nights because of the heavy weather. He feels that he is entitled to some consideration for taking this risk and has filed suit against the government.

The steamer ROBERT FULTON hit a dock at Two Harbors recently and damaged several plates and frames.

Along the Atlantic and Gulf Coasts

THE International Mercantile Marine Co. has purchased the former German steamer BERLIN from the British government and will place her in the Boston-New York-Mediterranean service of the White Star line. The BERLIN will be renamed ARABIC. She has a capacity of 17,324 tons and is equipped to carry 200 first-class, 300 second-class and 250 third-class passengers.

The shipping board steamer RADNOR was recently purchased by the Atlantic Gulf & Pacific Steamship Co.

In tow of the tug WARRIOR and bound from New York to Boston, the barge ALBANY collided with the steamer INCA on Oct. 10, receiving such damages that she sank soon after.

Capt. Dudley A. Brand, New London, Conn., who for more than 20 years was master of the steam yacht NARADA, died recently after a long illness.

With Charles L. Service as president and general manager and G. P. Bremmer treasurer, the Boston Engineering Co. of India Wharf, Boston, has been reorganized as a corporation, with increased facilities and wharfing privileges.

The Canadian-Pacific Ocean Services Co. has purchased from the Hamburg-American line the twin-screw KONIG FRIEDRICH AUGUST. The vessel, which was launched in 1906, has a capacity of 9462 tons, is 476 feet long and has a breadth of 55 feet. It is proposed to call her the MONTREAL. It has not been announced to what service the new vessel will be added.

The 72-year-old, 2-mast schooner FRED TYLER, blown ashore recently in Biddeford, Me., after it was abandoned by Captain Kin, has gone to pieces.

Submarine S-23 built by the Electric Boat Co., was launched recently at the Fore River yards of the Bethlehem Shipbuilding Corp., Quincy, Mass.

It has recently been announced that the steamer SCHODACK will inaugurate the new Far East service of the Barber line from Boston. She will sail from the

American port to Yokohama, Kobe, Shanghai, Hong Kong and Manila, giving Boston a direct service to these ports.

It has recently been announced that Capt. Ernest A. Johnson, formerly in command of the shipping board steamer ALANTHUS, is to command the new 4-mast schooner T. N. BRANSTALL, recently completed at the yards of Dunn & Elliott, Camden, Mass.

The biggest commercial ship ever built in Maine, the steel tanker REAPER, was recently launched at the yard of the Texas Steamship Co., Bath, Me. She was christened by Mrs. L. H. Lapham, New York City. The REAPER is 430 feet over all, 415 feet between perpendiculars, 56 beam and 32 feet 9 inches deep. The REAPER on account of being a tanker contains approximately 300,000 more rivets than a cargo steamship of the same dimensions. This is the fifth large ship to be launched by the Texas company this year.

A new wireless station has recently been opened at Siasconset, Nantucket, Mass., by the International Radio Telegraph Co., having a working radius of more than 250 miles by day and 1000 miles at night.

The barge ROCKLAND with a cargo of 750 tons of anthracite coal consigned to the Staples Coal Co., Boston, sank at the wharf recently. It is believed that the back of the craft broke under the strain of the load. She is an old vessel.

Announcement has been made that it will not be many months before the service of the White Star line between Boston and Mediterranean ports maintained at the present time by the steamers CANOPIC and CRETEIC will be augmented by the former North German Lloyd steamer BERLIN.

The JAMES C. HAMLEN recently left Boston for Norfolk to load a cargo of coal for the Azores. This new 4-mast schooner was recently completed at South Portland, Me., for the Boston firm of Rogers & Webb. She is commanded by Capt. George W. Torrey.

Nearly 1,000,000 bushels of grain, principally wheat and rye, have been

booked recently for shipment through the port of Boston for Antwerp, Rotterdam and Hamburg.

Capt. O. A. Gilbert of the Boston Ship Brokerage Co., who recently purchased the Beattie fleet of schooners, has sold the TOM BEATTIE. The schooner will be used in the service for Cape Verde islands.

Monthly steamship service between New Orleans and Rio de Janeiro, Brazil, has been established by the Lloyd-Brasillero, and the steamers MARANGUAPE, CAMPOS and UBERABA are now in the triangular service between the Louisiana port, Havana, and Rio. The ships are well prepared for passenger, as well as freight, traffic.

People of Mobile, Ala., presented a finely engraved tablet to the steamship CITY OF MOBILE, in commemoration of its construction by the Chickasaw Shipbuilding Co., at the Alabama port.

Steam schooner SPEEDWELL, owned by the Speedwell Navigation Co., New Orleans, and operated by the Otis Mahogany Mfg. Co. also of New Orleans, was lost in the Sept. 30, hurricane on the Gulf of Mexico. Three men and two women were lost with the ship, which was of 1250 tons. She was commanded by Capt. Charles Johnson, New Orleans. The survivors were picked up by the steamers SENOIL and MOBILE CITY.

Schooner THREE MARYS, Mobile to Havana with lumber and cotton, was lost in the Gulf of Mexico during the September hurricane, but all her crew, including Capt. Paul Marshall, Brooklyn, N. Y., were rescued by the United Fruit steamer LAKE FRIGATE, and brought to New Orleans.

Press dispatches state that the National Tube Co., Pittsburgh, is building 10 towboats and 90 barges to transport its product down the river to New Orleans, for transshipment to foreign ports.

The Mississippi Valley Waterways association has merged with the Mississippi Valley association, for greater strength in pressing the development of inland waterways throughout the valley. James E. Smith, former presi-

dent of the M. V. W. A., becomes chairman of the waterways division of the M. V. A.

The Ouachita Transportation Co., Inc., has completed arrangements with the Carter Packet Co., New Orleans, and the latter has opened regular steamship service between New Orleans and Monroe, La. One trip each way is made every week. Monroe business men save 15 per cent each way on freight rates by using the new steamboat service instead of rail. A government dredge boat is deepening the channel in the Ouachita river to Monroe.

The fall term of the United States shipping board's free marine engineers' school, opened Oct. 4, in New Orleans.

The Aluminum line has established service between New Orleans and ports of British and Dutch Guiana, with the American steamship GEORGE M. MACKENZIE, 4000 gross tons. On her first trip from Georgetown, this steamer brought 3500 tons of aluminum ore to the Republic Mining & Mfg. Co.

Capt. Peter Peppers, who was first mate of the river steamer NACHEZ, in its famous race with the ROBERT E. LEE, died in New Orleans late in October. He was 80 years old and had spent 60 years on river steamboats up and down the Mississippi.

One of the first of the Ferris-type wooden ships built by the United States shipping board to be converted into a steam barge, was launched Oct 9 from

the Murnam Shipbuilding Co., Mobile, Ala. She was christened LUTHER E. HOOPER, is of 3000 tons, and was sold by the shipping board to the Eastern Shore Transportation Co., Baltimore.

United Fruit Co.'s steamer ABANGAREZ went ashore off the lighthouse at Kingston, Jamaica, Oct. 9. Passengers were rescued and the liner pulled off by tugs, with slight damage.

New Orleans now has 62 steamship lines operating regular service in and out of that port.

According to figures just issued, the import trade of New Orleans, for the year ended June 30, 1920, shows an increase of more than \$118,000,000 over that of the year ended June 30, 1919. Lack of suitable port facilities cut off the imports of sisal, or Mexican hemp, some 25,000 tons below that of the fiscal year 1919. This hemp was valued at about \$10,000,000. Imports of sugar showed an increase of 400,000,000 pounds, while coffee imports gained 393,428,987 pounds. Other imports increased proportionately.

First passenger cruises to Mediterranean ports from New Orleans will be started early next year by the steamer ST. PAUL, of the International Mercantile Marine Co., according to F. T. DeCock, local manager at New Orleans.

All sailings by United States shipping board vessels for Cuba were held up by temporary embargo at New Orleans late in October, due to the moratorium

in effect in Cuba until Dec. 1. Four ships were affected—LAKE GADSDEN, LAKE FISHER, LAKE FRIAR and LAKE DANCEY. The embargo does not affect private lines. The shipping board averages about three sailings a week from New Orleans for Cuban ports. Three of the vessels tied up are allocated to the Ward line and one to the Gulf Navigation Co.

Seeking to pave the way for increased use of navigable inland streams, the United States coast and geodetic survey has issued a book, *The Inside Pilot Route*, describing in detail the navigable inland waters from Key West, Fla., to New Orleans, along the gulf coast. It may be had for 20 cents, from E. B. Latham, hydrographic and geodetic engineer, 314 Customhouse building, New Orleans.

The Gulf Navigation Co.'s new steamer FLORABA, arrived in New Orleans on her maiden voyage late in October, bringing sugar from Cuba. Her sister ship, GONZABA, belonging to the same company, cleared shortly after FLORABA's arrival, with general cargo for Havana and Tampico, Mexico. Both ships are provided with passenger accommodations, and both were built by the Dominion Shipbuilding Co., Toronto, Ont.

The American steamer DALANA, which cost the United States government rather more than \$700,000 to build, was sold Oct. 16, for \$23,005, at Norfolk, Va., to satisfy a libel claim against her owners, who had purchased her, at a previous sale, from the government for \$25,000. The court ruled that the first sale was insufficient, and ordered another, which brought \$2,000 less than the first.

Activities Along the Pacific Coast

WHILE reduced rail rates on cotton to Pacific coast terminals will become effective Nov. 4, twelve days earlier than originally intended, operators of transpacific vessels are not hopeful of booking any large amount of this cargo during the present season. Japan is reported overstocked with cotton and that country is not buying the normal amount. The increased rates recently eliminated Pacific coast ports from this business and the cotton movement thus far this season has been diverted to gulf ports. The lower through rates were worked out to place Pacific coast ports on an equality with gulf terminals.

The first vessel to complete a trip in the new Pacific-Argentine-Brazil line has returned to Seattle. This is the shipping board carrier PALLAS built by the Todd yards, Tacoma. The PALLAS left Puget Sound with a cargo of lumber and general cargo going to River Plate via the Magellan strait. She returned by way of Argentine and Brazilian ports bringing coffee and other products of the east coast of South America. It is expected this line will

be permanently maintained by the shipping board. Local buyers are importing considerable quantities of Argentine corn by steamers in this service.

Seattle managing agents of shipping board boats are elated at the board's decision to pay agents a percentage of the gross earnings of carriers. This plan has been advocated for months and, now that it is effective, operators are expected to be spurred to greater efforts.

The Osaka Shosen Kaisha has placed two new 18,000-ton passenger and freight steamers on the Oriental-Puget sound route. These are the ALABAMA MARU and ARIZONA MARU. In conjunction with four other carriers of the same type regular service is being maintained out of Tacoma and Seattle. The six 10,000-ton vessels, with which this company inaugurated its Puget sound service in 1908, now are being operated in the company's Japan-South American service.

The shipping board freighter EDMORE is idle at Seattle awaiting orders. This

vessel was withdrawn from the Oriental route as she was under option of sale to the Empire Steamship Co., New York. It is understood negotiations have failed and the carrier is awaiting assignment.

Resumption of American-Hawaiian line service to Puget sound will take place in November with the arrival of the steamer HAWAIIAN. Five years ago the American-Hawaiian line withdrew from the west coast where for many years it had been an active factor in developing trade. It is announced that a fortnightly service will be maintained.

Notwithstanding depression in the oriental and other overseas trades, the water commerce of Seattle increased 183,167 tons valued at \$11,000,000 in the four months ended Sept. 30 as compared with the same period of 1919. This gain is largely due to the revival of intercoastal trade on which several new lines are now operating. Judging from present announcements, the service between north Pacific and north Atlantic ports will be maintained by a fleet of approximately 92 steel vessels.

Practical Ideas For The Engineer

Crane Handles Canal Freight—Laying Out Cant Frames—
New Type Of Dock—Range Finders—Repairing Stern Post

RAPID progress in the method of freight handling is well demonstrated by two cranes, recently erected by the Shaw crane works of Manning, Maxwell & Moore, Inc., and installed on pier 6, New York state barge canal terminal, New York city. Formerly handled by a whip boom, block and tackle and a horse, and taking eight men in the hold four days to unload a barge of 175 tons of miscellaneous freight, merchandise at this pier is now being moved in similar volume by one crane and three men in the hold in one 8-hour day. This latter rate, it is believed, will be considerably increased as the men become more familiar with the crane.

The cranes, as shown by the accompanying illustration, are of the overhead type, traveling on two tracks, one carried over the front row of the building columns, and the other 10 feet back over the roof of the pier. They have four movements; travel, boom hoist, trolley rack and hoist hook. The boom, which has an outboard reach of 32 feet, 6 inches and an inboard reach of 10 feet, is pivoted to the traveling frame. The capacity of each crane is 3000

pounds, with the boom horizontal or at any angle up to 45 degrees and with the trolley in any position on the boom. All parts of the cranes are so proportioned that the factor of safety will in no case be less than five when the cranes are handling their rated load.

Inasmuch as the cranes travel on tracks above the pier shed, they do not obstruct the apron of the shed, and while traveling, the boom is nearly vertical, providing thus for ample clearance of the shed and the ship's rigging. When the desired location for the crane is reached, the boom is lowered, the outboard end being over the hatch and the inboard end reaching inside the pier shed. The load, therefore, can be carried from the hold into the shed and in a straight line to eliminate the use of space necessary for the swinging boom.

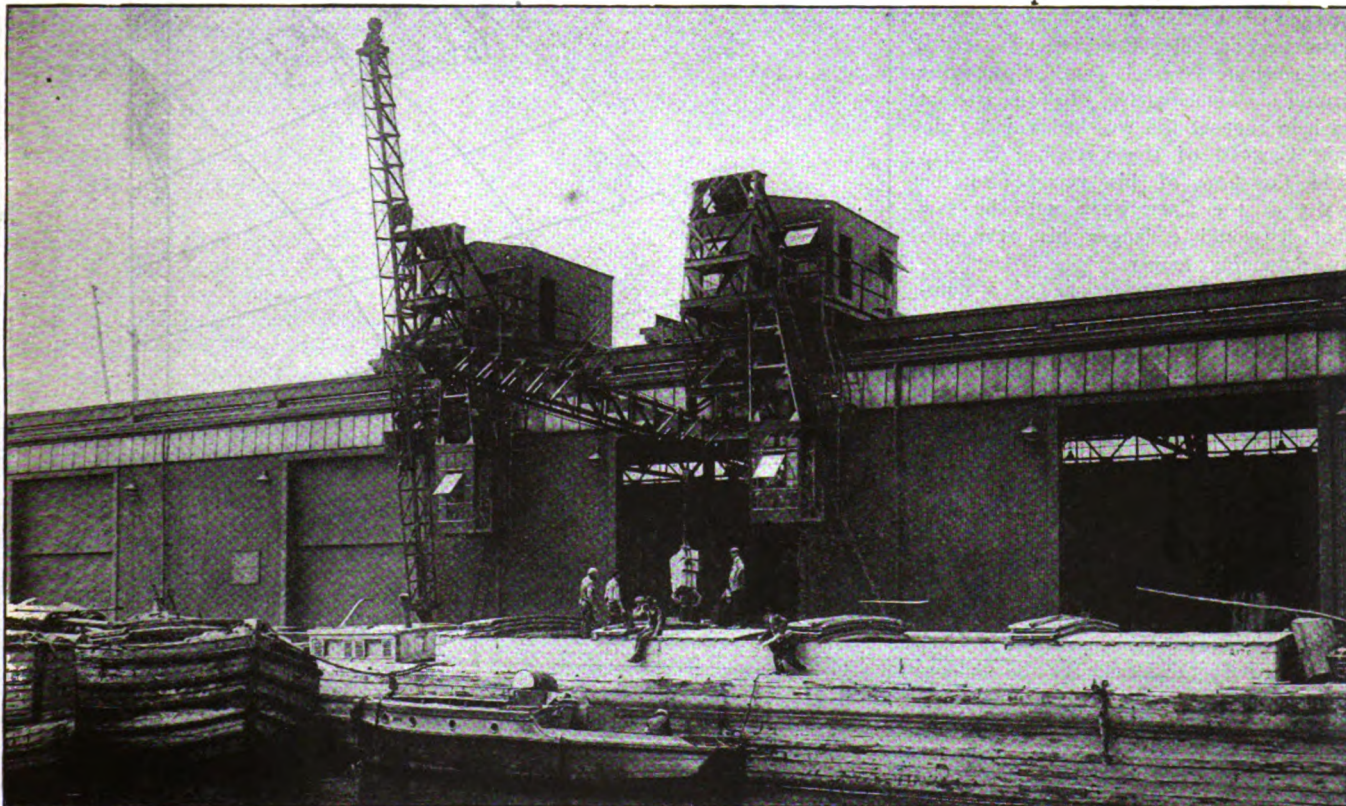
The hoist hook and rack have a speed of 125 feet per minute with the full load and 200 feet per minute with no load. The boom may be hoisted from horizontal to the vertical position in one minute, the traveling speed being 100 feet per minute. Being located on the crane frame well to the rear the hook hoist, trolley, rack and boom hoist

machinery acts as a counterweight. Separate motors operate the hook hoist and rack, and are independent of each other in speed and direction of travel. The operator's cage, suspended from the crane frame at one end of the boom and at a proper height, gives the operator a clear view of the load.

Both cranes are equipped with 220-volt direct-current motors, fully enclosed. The hook hoist and rack motors are 18-horsepower, compound-wound, and the boom and travel motors, 8-horsepower, series-wound. Controllers are of the drum type, with vertical handles. Hook hoist and rack controllers are arranged for dynamic lowering while the boom and travel are simple reversing.

Gears Give Long Service

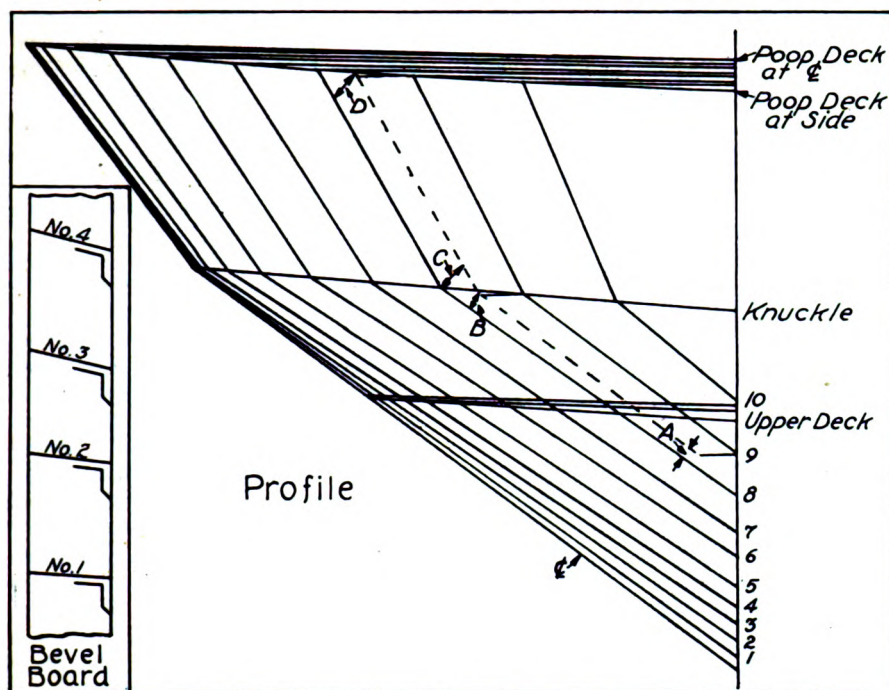
Evidence of the efficiency of American-built gear reduction sets is given by those in the oil burning steamer SACANDAGA, the fourth ship built for the Emergency Fleet corporation at Hog Island. These gears and the turbine had been run 43,000 miles when their covers were removed for the first time at New Orleans recently for thorough inspection.



THESE TWO CRANES RECENTLY INSTALLED AT THE NEW YORK STATE BARGE CANAL TERMINAL HAVE REDUCED MATERIALLY TIME FOR UNLOADING FREIGHT

Gen. Arsene Perilliat, chief engineer of the New Orleans dock board, died in that city, late in October.

Lay down stern framing, profile and



METHOD OF DIAGRAMMING BEVELS ON PROFILE—ALSO BEVEL BOARD FOR USE OF YARD FORCE

tances *A*, *B*, *C* and *D*, and set them out from squared line on cant frame No. 8, plan view, as shown. Now draw lines from cant frame No. 9 to these points on cant frame No. 8, thus giving you the desired bevel required for No. 9 cant frame. These bevel lines are marked 1, 2, 3 and 4, with 1 representing the bevel at transom end of cant, 2 the bevel below knuckle, 3 the bevel above knuckle and 4 the bevel at deck.

Now transfer them on a bevel board as shown in illustration, thus making it easy for the furnaceman.

Design New Type Of Dock

Engineering developments of the last few years have resulted in bringing out the design of a new type of floating drydock, a longitudinally trussed sectional dock. This type of drydock was designed to overcome the flexibility of the ordinary sectional dock and still retain its excellent self-docking features. Furthermore, it was designed to produce a floating dock that would be equally rigid whether built of steel, of wood, or with wooden pontoons and steel wings.

For some time, the Crandall Engineering Co., East Boston, Mass., had been studying this problem and its researches resulted in this new type. This drydock is sectional. In the wing walls of each section is constructed the panel of a longitudinal truss so designed that when the sections are connected together these panels form one truss in each wing and a stiff backbone for the dock. The panel points are made to come

at the pontoon connections and at these points the truss members terminate in steel castings which form the lugs for the pin connections which join at the same time the pontoons and the truss panels. To separate the pontoons, it is only necessary to remove four pins.

The pumping machinery consists of four electric or steam operated centri-

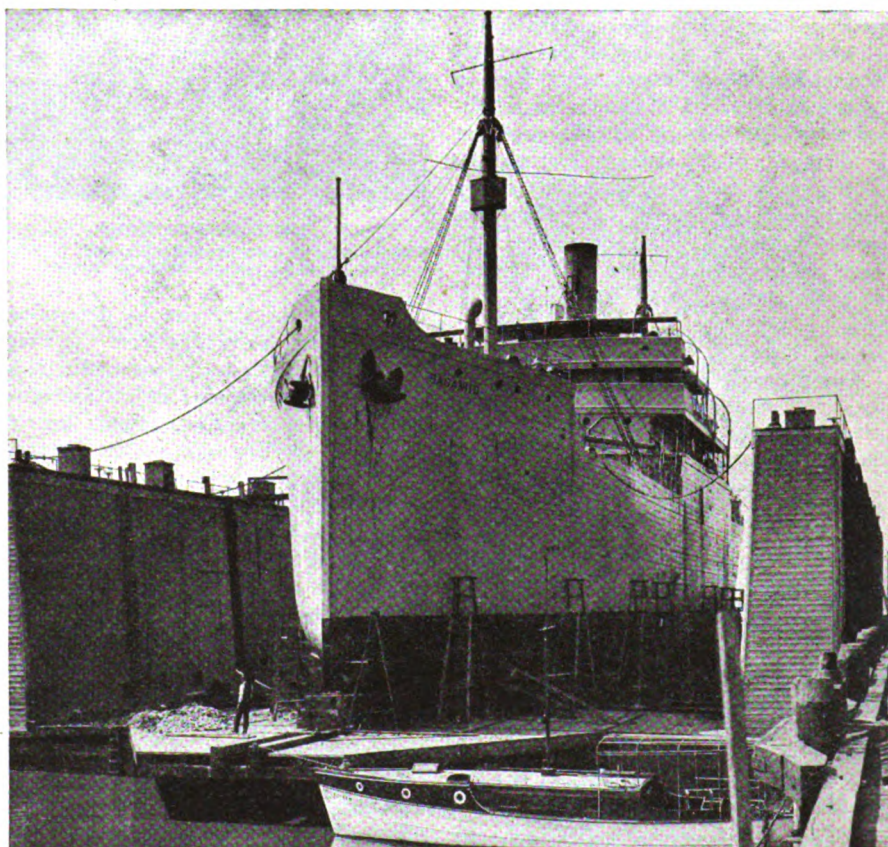
fugal pumps in each pontoon, the size of the pumps depending upon the desired speed of operation. The control of these pumps is centralized at some convenient point where the dockmaster may see the gages indicating the depth of water in each compartment and govern the pumping accordingly. For supporting the vessel in the dock, the bilge block system is used. These docks are equipped with the patent releasing bilge blocks of the designers operated by endless chains and hand winches located on the wing walls.

Successful installations of drydocks of this type have been made at Charleston, S. C., Savannah, Ga., Jacksonville, Fla., and Beaumont, Tex. Another dock of this type is now under construction at Pensacola, Fla.

Standardize Motorships

British shipowners and shipbuilders, according to information obtained by the Bankers Trust Co., New York, through its foreign information department, are not only increasing the output of motor powered ships, but have begun to standardize this type of vessels.

Standardized construction is regarded as a means by which the handicap of higher building costs of motorships as compared to steamships, may be offset. Standardization is illustrated in a Bel-



DRYDOCK BUILT ON NEW CONSTRUCTION PRINCIPLE
8000-ton docks at Charleston S. C., employing the longitudinal truss method of construction

fast yard's contract for six 14,000-ton motor cargo ships, and five sister ships to carry 10,500 tons.

In the larger ships, the engines are of greater power but are the same type as those installed in the smaller ships. The larger ships are being equipped with two 8-cylinder engines, while the other ships will have two 6-cylinder engines. This standardization permits of simplified, cheaper, and speedier construction.

Use Of Rangefinders

Use of range finders for navigation purposes has for some time been made a subject of recommendation by the British admiralty *Manual of Navigation* and recently they have been adopted by a number of British merchant vessels. Rangefinders, specially constructed for navigational purposes, now are available at a cost insignificant compared with the value of a ship and her cargo. So varied and important are the uses to which these instruments can be put that it is likely in the near future they will come to be regarded as essentially a part of a ship's equipment as the patent log or sounding machine.

On warships and fortresses, rangefinders with a base length of 35 feet, and telescopes with a magnification of 28 diameters, are used. These are capable of distinguishing intervals of 70 yards at a distance of 10 miles. But for merchant ships, instruments usually weigh not more than 10 pounds, with a base length of 1 meter (39.37 inches) and a magnification of 14 diameters. These instruments have a marginal error of 15 yards at a distance of 1 mile, and of 380 yards at a distance of 5 miles. Instruments with a base of 4 feet 6 inches and a magnifying power of 20 diameters, easily handled by a single observer, have an uncertainty of only 194 yards at a distance of 5 miles.

Used at Night

The rangefinder can be used as readily as a sextant, and the distance is read at a glance from the scale. The finder's importance in determining the distance from an object, when cross bearings are impossible, is obvious. At night and in hazy weather, when every navigator knows the difficulty of correctly estimating the distance of lights it is specially useful. By means of an astigmatizer, which draws out a light into a vertical streak, the alignment in the central field of the telescope of the two reflections of a light can be made as easily as when working with an object of vertical dimensions in daylight.

When a navigator relies on the principle of "doubling the angle on the bow" or the four point bearing to de-

termine his distance from a light or point, his fix of position may be affected by tides or unknown currents. With a rangefinder and the bearing of an object he can determine his position in a few seconds. In rounding a point he can maintain accurately the desired distance and save steaming time. If the fog lifts for a few seconds, the rangefinder will determine the distance of any light or mark, which may be temporarily in sight. Coming to anchor the rangefinder may be useful in determining the distance from marks or adjacent ships. When two objects are in sight, the correct

ing a barrel overboard and altering the course so as to keep the barrel vertically under the sun. The sextant takes the angle between the sun and water line of the barrel, and the rangefinder shows the distance of the barrel, which enables the dip to be readily determined. Another vessel off in the fog also may be used as an artificial horizon.

At night, when it may be desirable to secure a line of position, stars may be visible but the horizon obscure. In such a case the ship's course may be altered till the star is right astern, and a Holme's light may be thrown overboard. While the angle between the star and the light is being taken, the rangefinder will show the distance of the light. A series of observations carried out in this way are reported to have shown good results.

Collisions often occur because the distance away of another ship has not been correctly estimated. The rangefinder would determine in a few seconds the distance of another ship by day or night, and thus help in avoiding disaster and loss.

Unique Ship Repair

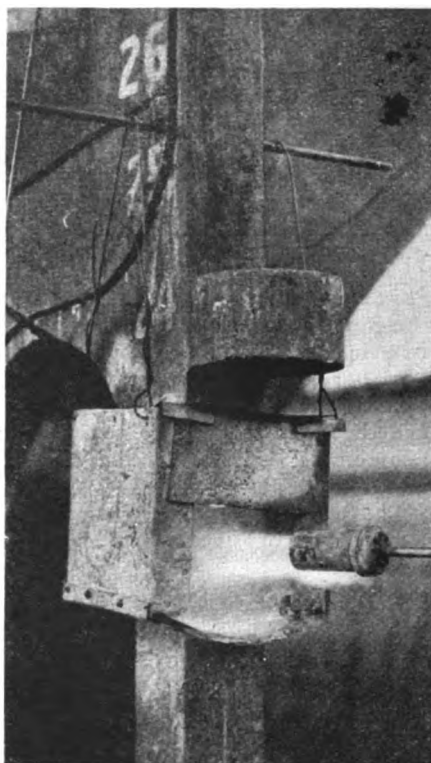
When the steamship S. B. HUNT was hoisted into the air and her stern frame was exposed on the large dock of the Morse Dry Dock & Repair Co., Brooklyn, N. Y., recently, it was found that the stern frame casting was buckled and curled, and that the stern frame would not function because the rudder pintle bushings were worn out. The situation required a high degree of ship repair ingenuity.

To follow ordinary procedure meant that the stern frame be disconnected, three or four plates taken out, the stern frame removed, the piece sent to the shops to be faired, machined and then replaced. Such procedure meant a loss of considerable time, much more labor and increased costs on that particular job.

It was decided that the frame could be straightened without its being detached from the ship, and an all night gang was assigned to the work. Heating boxes were constructed to aid the kerosene blowers in bringing the frame to a bending heat. Pressure from hydraulic jacks then was applied and the frame made straight and true.

The Morse company estimates the actual work saved the shipowner \$25,000, to say nothing of the time his vessel would have been laid up under the ordinary routine—probably from 25 to 30 days.

Capt. Andrew Hurry, 62, of the staff of the United Fruit Co.'s fleet, died at New Orleans recently.



HEATING STERN POST

Unique repair job done by Morse Dry Dock & Repair Co., Brooklyn, without drydocking steamer

position of the ship can be determined by sweeping the ranges from the chart, and the difference between the magnetic bearing of either object as shown by the chart and the compass bearing will give the deviation of the compass for the ship's head.

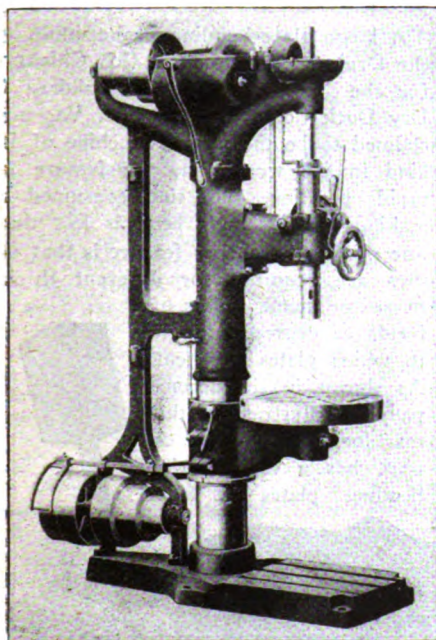
A French naval officer has described a number of novel ways in which the rangefinder can be probably used in navigation. Sometimes it is desirable to fix the ship's position from the sun or other heavenly body, when it is over the land. In that case the correction for dip is very important, as the dip depends on the distance of the shore horizon. The rangefinder determines that distance with sufficient accuracy. Often the sun is visible at noon, while the horizon is obscured by haze or fog. In such circumstances it is possible to take a sight by throw-

Equipment Used Afloat, Ashore

Upright Drill—Tilting Press—Tube Boiler—Bending Brake

Builds Heavy Pattern Head Drilling Machine

To meet production requirements an upright drilling machine has been designed by the Sibley Machine Co., South Bend, Ind. Equipment includes interchangeable die-cast split bearings made from antifriction metal and a geared feed which has four changes of speed and a neutral position. The latter is governed by moving a knob on the center of the hand wheel in connection with a sliding spline, four feeds being provided for each spindle speed. The initial drive of the shaft is from the top cone shaft through bronze spur gears and two-to-one steel spirals. Hand speed and return of spindle is through the medium of

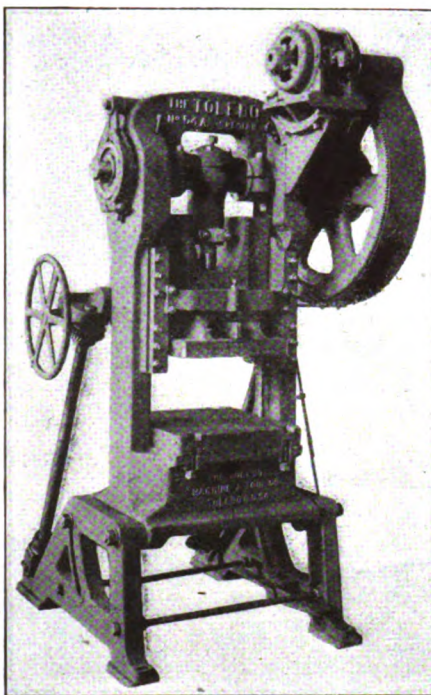


STATIONARY HEAD DRILLING MACHINE WHICH HAS FOUR SPEED CHANGES AND A NEUTRAL POSITION

a three-lever regulating device at the right of the feed box. Those parts dangerous to the operator are enclosed.

The base is ribbed and braced with T-slots for clamping the work. Increased length of bearings on head and arms and sufficient table support aid in accurate work. The spindle is balanced by a weight supported inside of the column and is operated by a chain drive. This has a ball thrust bearing. Back gears are of the sliding type.

Lubrication is provided by immersing the gears in the lower feed box in an



MOTOR IS KEPT VERTICAL WHETHER PRESS IS UPRIGHT OR INCLINED

oil bath and enclosing them. The steel worm, which meshes with the gears, also runs in oil. Bearings are equipped with oil cups, grooves and channels, thus insuring distribution. The loose pulley is self-oiling. Attachments may be obtained, which include positive geared tapping devices, geared or belted motor drive, round or square table with T-slots and oil pocket, oil pump outfit and quarter-turn countershaft.

Designs Tilting Press

Operative in either an upright or an inclined position, the new press shown in the accompanying illustrations possesses several unique features. A turn of the hand wheel permits a change of position. The press is entirely self-contained, being driven by a direct-connected electric motor. The motor bracket is so arranged that it keeps the motor vertical whether the press is vertical or inclined to any angle within its limits. The pinion always is in mesh.

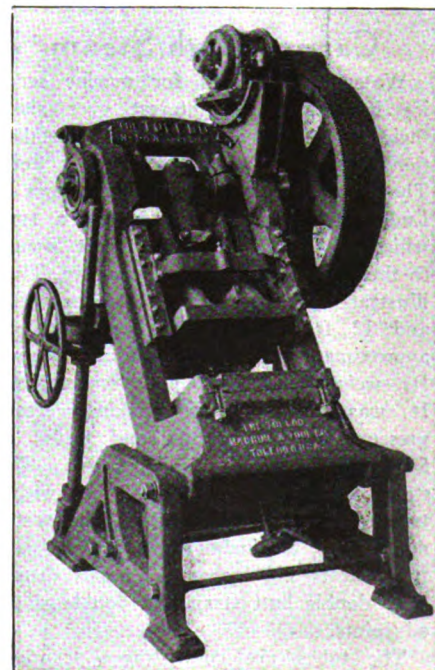
The distance between the uprights, 24 inches, is somewhat greater than usual with presses of this size, the weight being 6500 pounds, 1050 pounds of which represents the flywheel. The slide, 21 inches from front to back and 19½ inches from right to left, is of liberal proportions and is guided in sub-

stantial gibs to insure greater accuracy. The slide has a 2-inch stroke. The bed's area is 24 inches from front to back and 23 inches from right to left. The bed has a 12x12-inch opening, with a bolster plate 3 inches thick.

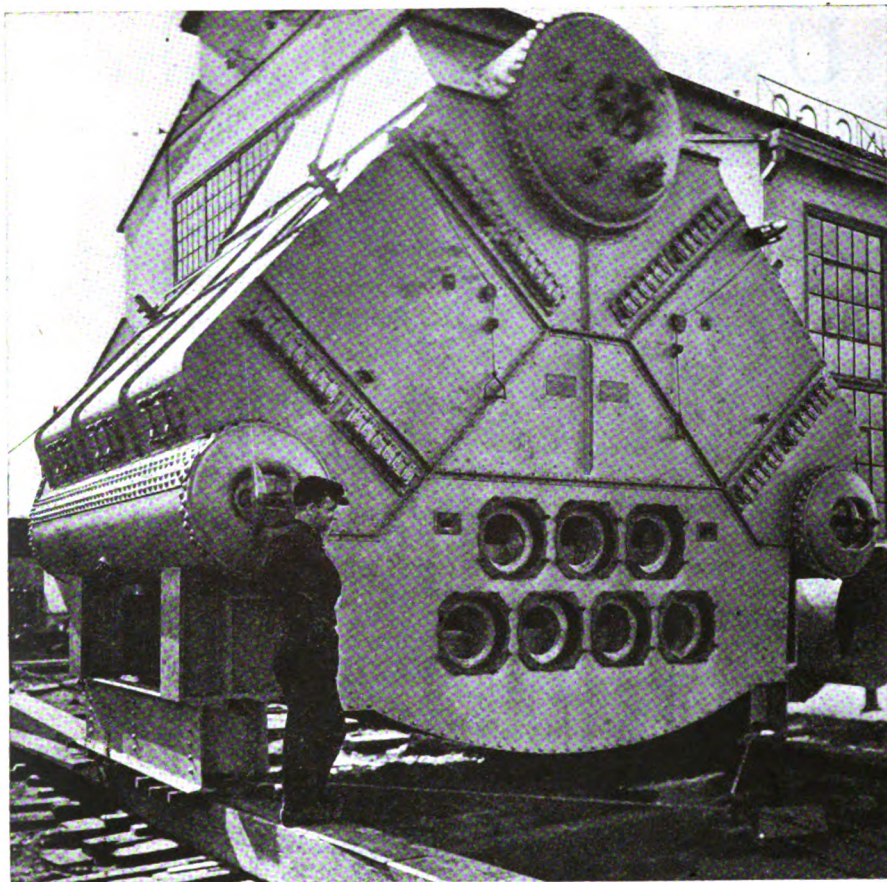
With the slide adjusted at maximum height, the distance from the slide to the press bed is 13 inches, with the slide at the bottom of its stroke. Some of these dimensions can be changed readily to suit special requirements. The press which recently was designed and is being built by the Toledo Machine & Tool Co., Toledo, Ohio, may be furnished with or without gearing and with or without the bar knockout in the slide and the direct-connected lower liftout, as well as with or without the motor bracket. The press also is built with the frame arched out from front to back and with a 14-inch opening in each housing to permit of feeding stock from right to left or vice versa.

Compass Is Ancient

The mariner's compass is said to have been known to the Chinese as early as 1115 B. C. It was brought to Europe by Marco Polo, A. D., 1260. Flavio Gioja, a navigator of Naples, is credited with having introduced the suspended needle in 1302. The compass' variation was discovered by Columbus



TURNING OF HAND WHEEL CHANGES POSITION FROM UPRIGHT TO INCLINED



MONSTER BOILER FOR NAVAL PLANT

Ludlum type boiler weighing 85,000 pounds made by the New York Engineering Co., Yonkers, N. Y., for experiment station of the navy

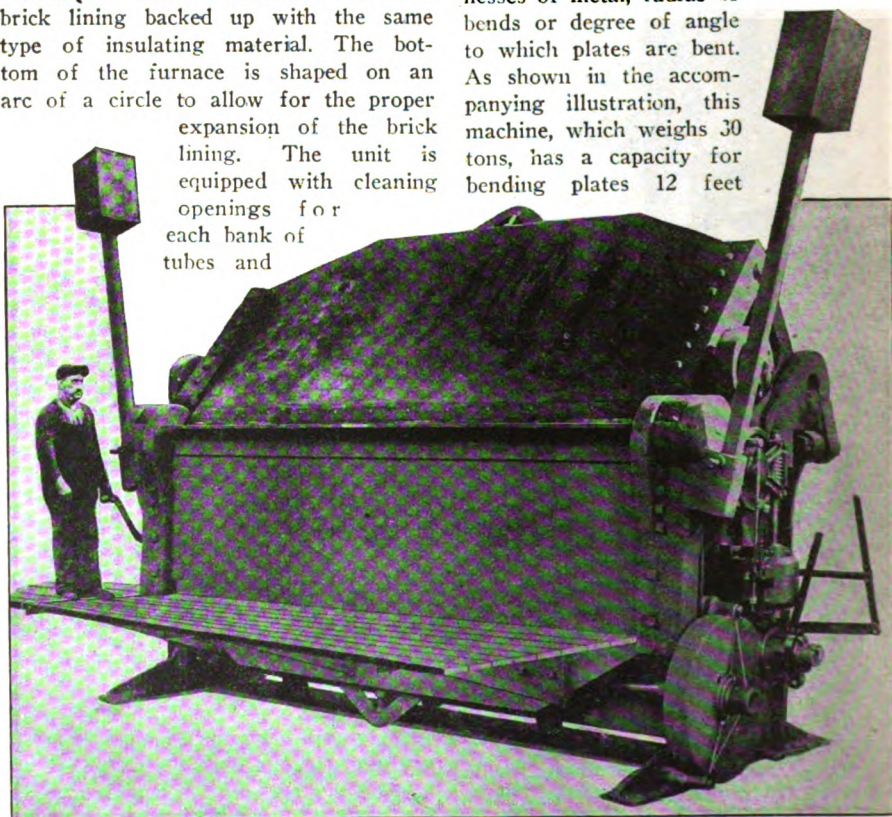
in 1492 and the dip of the needle by Robert Normand in 1576. The compass box and hanging compass is said to have been invented by William Barlow in 1608 while the graduated compass card is credited to Joseph Bing in 1602.

Carries High Steam

Water tube boilers for marine service have attracted interest ever since their active development and installation on vessels of the emergency fleet. The accompanying illustration shows a Ludlum-type water tube boiler, a type which is of particular interest owing to the large size and high pressure. That illustrated is 15 feet high, 17½ feet wide and 12 feet deep, with a furnace of approximately 500 cubic feet volume. Its weight is 85,000 pounds complete. It was built for a working steam pressure of 350 pounds, and tested to 550 pounds hydraulic pressure. The steam drum is 48 inches by 12 feet, with a tube sheet 11½ inches thick. The water drums are 30 inches by 12 feet with tube sheets 11½ inches thick. All drums have double butt strap and double riveted joints.

The tubes are cold drawn seamless steel, 1½ inches outside diameter. The casing is steel plate backed with as-

bestos mill board and 2 inches of high tempered special insulating material. The combustion chamber has a 9-inch fire brick lining backed up with the same type of insulating material. The bottom of the furnace is shaped on an arc of a circle to allow for the proper expansion of the brick lining. The unit is equipped with cleaning openings for each bank of tubes and



RIGHT ANGLE BENDS ARE MADE WITH THIS MACHINE IN LESS THAN A MINUTE

also with automatic soot blowers, the latter being operated by a chain pull. They are designed automatically to dispose of water of condensation in the piping and also to shut off the steam automatically after cleaning is completed.

This boiler was too large to be shipped by rail and it was transported on a barge, completely assembled, as illustrated. On arrival at the Annapolis naval station it was necessary only to set it on its foundation and connect up piping and smoke stack. No mason work or boiler setting was required.

The equipment was built in the shops of the New York Engineering Co., at Yonkers-on-the-Hudson, N. Y. This company is now at work on a battery of boilers of the same type for the United States navy, each unit of which will be much larger than the one described. When completed they will be installed in one of the new battleships now under construction.

Bends Heavy Plates

A large plate bending brake, built by the Dreis & Krump Mfg. Co., Chicago, for the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and claimed to be the largest machine of its kind in the world, has the feature of rapid operation. The time consumed in making a right angle bend is less than one minute. Another feature is that no dies are required for different thicknesses of metal, radius of bends or degree of angle to which plates are bent. As shown in the accompanying illustration, this machine, which weighs 30 tons, has a capacity for bending plates 12 feet

long up to $\frac{3}{4}$ -inch thick cold and is driven by a 40-horsepower direct-connected motor.

Construction of the brake is of steel throughout, the main body being constructed of large steel plates braced with truss rods and the housings of cast steel. The links connecting the upper and lower jaws are forgings. Counterweights balance the bending leaf. The motor is mounted within the machine and drives the clutch shaft, which has direct and reverse frictions. An idle gear provides the reverse motion for lowering the bending leaf. Raising and lowering of the upper jaw is accomplished by means of a power clamp consisting of a manganese bronze gear mounted on an eccentric controlled by a lever on each end. Friction clutches trip out when sufficient pressure is exerted on the plate and this pressure flattens buckled

plates and clamps them securely and requires no adjustment for the various thicknesses of plates.

A draw bolt on each end provides adjustment for sharp and rounding corners. As sharp as $1\frac{1}{2}$ -inch inside radius can be bent on $\frac{3}{4}$ -inch plates, full length and as large a radius as is desired. The upper jaw is faced with a tool steel edge. The opening between jaws is sufficient so that four sides of a plate can be flanged by inserting blocks between the two side flanges after they have been bent. After the plate has been clamped, a positive friction clutch on the drive shaft is engaged, thus actuating the bending leaf which is driven by three steel arched racks. An adjustable dog is provided, which automatically stops the bending leaf at any desired angle. While the racks drive the bending leaf considerably over a right angle, when

the bending leaf is lowered, the racks drop below the bed so that the plate is free to pass through between the housings. This handling permits bends to be made at any distance from front or rear end of the plate.

Late Marine Patents

Copies of any one of these patents can be obtained by forwarding 25 cents in stamps to Siggers and Siggers, National Union Insurance building, Washington, and mentioning THE MARINE REVIEW.

1340288—Submarine mine—Thomas K. North, Westminster, London, England, assignor to Vickers, Ltd., Westminster, England.

1333190—Barge, Joseph Thies, Great Bend, Kans.
1353235—Ship construction—Lars J. Hagen, Portland, Oreg.

1352410—Submarine detector, George M. Marshall, Lake Francis, Man., Can.

1023499—Gun mount for boats, William B. Shearer, New York, assignor to International Torpedo Boat Corp., Wilmington, Del.

1653623—Device for raising sunken vessels, Walter C. Beckwith, Fostoria, O.

Business News for the Marine Trade

The Appalachian Corp., New Orleans, is reported planning to construct a warehouse and marine terminal at Havana Cuba. Plans have been made for acquiring a piece of waterfront property in Havana bay with sufficient wharf frontage for from 10 to 12 ships.

Following the arrival of the last of the pontoons for the new floating drydock for the Bethlehem Shipbuilding Co., Sparrows Point, Md., work on erecting the structure has been started. It is expected that the new dock will be finished and ready for operation about the middle of December. When completed the dock will have a lifting capacity of about 10,000 tons. This will make two floating drydocks in operation at the Sparrows Point plant.

Bids for the construction of the first lock on the Illinois deep waterway were opened recently at Chicago. The lowest bid was \$1,373,115. The waterway will connect the Great Lakes with the Gulf of Mexico by the way of the Illinois and Mississippi rivers.

The Los Angeles Shipbuilding & Dry Dock Co., Los Angeles, has offered first mortgage bonds of the plant for sale. The bonds have been underwritten by Los Angeles bankers and brokers. The issue amounts to \$1,250,000. The securities consist of the only mortgage on the plant.

Capitalized at \$100,000, the Aetna Steamship Corp., New York, general brokers in vessels, etc., recently was incorporated by F. E. Rowland, Lynbrook, L. I., and others.

The Black Star Steamship Co., 15 Exchange place, Jersey City, N. J., general steamship transportation, etc., recently was incorporated with a capital stock of \$500,000.

The Oregon-Washington Railroad & Navigation Co., Portland, Oreg., is building a dock, 80 x 400 feet, at Astoria, Oreg., at a cost of \$80,000. Special freight-handling equipment will be installed. Sam Murry, Portland, is chief engineer.

The Beaumont Marine Engineering Works, Beaumont, Tex., recently was incorporated with a capital stock of \$15,000, by J. C. Ellison, Roy Kellogg and John Currie.

The Seacraft Corp. of California, Los Angeles, recently incorporated with a capital stock of \$250,000,

has acquired the plant of the Marine Equipment Co. at Wilmington, Los Angeles harbor, which it will improve with new machine and metal working shops and shipways. It will specialize in the building of pleasure craft. F. A. Featherstone is president and Marco Hellman, treasurer, of the company.

The Newport Shipbuilding Co., Newbern, N. C., is planning the construction of a new shipyard at Wilmington, N. C.

The capital stock of the Atlantic Welding Works, Columbia, S. C., recently was increased from \$20,000 to \$25,000.

The New York Shipbuilding Corp., Camden, N. J., has orders on hand to insure capacity production for many months. Seven passenger vessels are being built for the United States shipping board; four tankers for the Vacuum Oil Co. and 15 passenger and cargo ships for other interests. The yard is now giving employment to about 18,000 men.

The National Shipbuilding & Machinery Co., Baltimore, of which J. F. Connell, Woolworth building, New York, is vice president and general manager, has purchased the property of the Maryland Shipbuilding Co., comprising 51 acres of land, 2600-foot waterfront; 1000-foot drydock, four shipways and various other facilities.

The Great Northern Concrete Shipbuilding Co., Vancouver, Wash., which built five concrete ships during the war, recently filed a petition for dissolution.

The Hodges Boiler & Machine Works Co., Mobile, Ala., recently was organized with a capital stock of \$50,000, to manufacture boilers, tanks, machinery, etc., by Dolan C. Hedges and William W. Strong.

The shipping board has received bids for material and equipment at the former shipyard at Mobile, Ala., operated by Fred T. Ley & Co., 19 West Forty-fourth street, New York.

The bureau of yards and docks, Washington, has completed plans for the erection of a 1-story machine shop, for the navy department, to be 82 x 300 feet, a foundry 60 x 100 feet and a power plant, 70 x 91 feet.

The Bethlehem Shipbuilding Co., Wilmington, Del., has taken a contract for four vessels for the St

Clark Navigation Co. insuring the continuance of operations at its Harlan shipyard. The plant will soon complete its last ship under contract for the Emergency fleet corporation.

The New Jersey Gauge Co., 712 Monroe street, West New York, N. J., recently was organized to manufacture pressure gages and other precision equipment, by George L. Spence, 3 Crescent avenue, Grantwood, N. J., and others.

The Gray Engineering Works, Galveston, Tex., has acquired property on the ship canal at Clinton near Houston, Tex., and has plans under way for establishing a shipyard, including a drydock and a floating machine shop for repair work. The initial drydock will have a capacity of 2500 tons, while a structure to be built later will have facilities for 10,000 tons, with machine shops, foundries and other buildings. It will be built at an estimated cost of \$200,000. H. Gray is president of the company.

The Walsh & Wedner Boiler Co., Chattanooga, Tenn., has completed plans for the erection of several additions to its plant, to replace temporary existing structures. It recently increased its capital stock from \$300,000 to \$700,000.

The Stone Towing Co., Wilmington, N. C., plans the construction of a marine railroad and the establishment of shops.

The Globe Shipbuilding & Dry Dock Co., Fairfield, Baltimore, has made application to build four 1-story buildings at a cost of \$10,000.

The South Baltimore Harbor & Improvement Co., Fidelity building, Baltimore, has been granted a permit to erect a foundry building, 16 x 39 feet, at Pennington avenue and Blossom street, Curtis Bay, Baltimore.

The McNamara Bros., Co., Inc., Kloman street, Westport, Md., manufacturer of boilers, tanks etc., plans the erection of an addition to its plant, 1-story, 90 x 200 feet, to be built at an estimated cost of \$25,000.

The Blackmer Rotary Pump Co., Petoskey, Mich., recently increased its capital stock from \$180,000 to \$280,000.

The Roto Pump Mfg. Co., Detroit, recently was organized by William L. Rutledge, 1600 McLellan avenue, and others, with a capital stock of \$50,000,

Business Changes

M. Inouye, first Japanese representative of the Osaka Shosen Kaisha to appear in the south, has established offices in New Orleans. The company seeks especially to increase cotton shipments to Japan. The big Japanese company has made through traffic arrangements with the Illinois Central railroad and the Ward line of steamers, so that direct traffic is maintained with the interior of the United States and with the ports of Latin-America.

The Cuban-American line has opened a regular New Orleans-Havana service, for freight only, with the steamers OWEGO, KENNEDY, NILES, and LIZZIE, operating between the two ports. E. A. Martinez is agent in New Orleans.

The American marine insurance syndicates will open a branch in New Orleans, W. C. Foley, of that organization, having visited the Louisiana port late in October to install such an office.

The International Mercantile Marine Co. has opened offices at 700 Gravier street, New Orleans, with F. T. DeCock, southern passenger manager, in charge.

The Menger Marine Hardware & Supply Co., New Orleans, has added the Minus-Leisner, 2-cycle, diesel-type engine, and has installed one of these engines in the tug MIANUS, for demonstration purposes.

Charles Cory & Son, Inc., announce the removal of their offices from 290 Hudson street, 186 Spring street and 487-9 Greenwich street, New York, to 183-87 Varick street. The new Cory building, which the business will occupy, is located at the corner of King street. It has more than 100,000 square feet of floor space.

Cunard line officials in New York announce it has opened a new office in Berlin in conjunction with the Donaldson and Anchor lines, in the Hotel Bristol. The company also plans to open an office in Detroit, for which a location has been leased at 35 Washington boulevard.

Seabury & deZafra, Inc., New York, consulting naval architects and marine engineers, have enlarged their offices at 150 Nassau street, to better accommodate the increase in their business. Among the contracts which they have recently negotiated in the interests of their clients are two, 450 indicated horsepower, fore and aft compound marine engines with the John W. Sullivan Co. and two 12-foot Scotch boilers with the Kingsford Foundry & Machine Works.

to engage in the manufacture of pumps and accessories.

The Interstate Coal & Dock Co., Green Bay, Wis., has been granted authority to increase its capital stock from \$150,000 to \$300,000, and plans to increase its coal handling and storage capacity from 50 to 100 per cent.

In connection with harbor developments at Staten Island, the New York harbor commission, Murray Hurlbert, commissioner of docks, will install considerable mechanical equipment for freight handling, comprising cranes, monorail tracks and cars, elevators, hoisting machinery, etc.

New buildings and machinery will be installed at the plant of the Merrill-Stevens Shipbuilding Corp., Jacksonville, Fla. Definite plans have not been announced.

Coal handling facilities will be established on the Savannah river near Savannah, Ga. They will be owned and operated by the Savannah Coal & Dock Co., New York. Contracts for a temporary plant, costing \$200,000, have been awarded. The permanent plant is to be completed by next October. The plant site is the location formerly used as a shipyard by the Foundation Co., New York.

Plans are being drawn for a welding shop for the Portsmouth, N. H., navy yard. It will be 2-stories, 30 x 53 feet, and cost about \$15,000. No new equipment will be needed.

Operations have been discontinued at the New Jersey and Pennsylvania shipyards of the Pusey & Jones Co., Gloucester City, N. J.

John Meigs, Philadelphia, former assistant director of the Philadelphia department of wharves and docks, and a number of associates, have organized a company to establish a shipyard and repair works

in the vicinity of Gloucester City, N. J., and have secured options on a site on the Delaware river, near the Reading ferry. Plans are being prepared for a machine shop, metal-working shops, woodworking department and a large floating dry-dock. R. E. Havens, 507 Federal street, is engineer in charge.

The Worthington Pump & Machinery Corp., New York, is receiving estimates from Cincinnati contractors for the erection of an addition to its Laidlaw works at St. Bernard, O., near Cincinnati. The addition will be 1-story, 50 x 75 feet, and will be used as a clearing room.

The Fabricated Ship Corp., Milwaukee, has started work on dismantling its plant and yard at the foot of Twelfth street, Milwaukee. It has completed its contract with the government to build 13 fabricated ships, the last of which was delivered Oct. 28. The corporation was formed in June 1918, by members of the Coddington and Newton Engineering companies, Milwaukee.

The Black & Decker Mfg. Co., Towson, Baltimore, manufacturer of electrically operated drills, etc., has awarded a contract to the Development &

Construction Co., American building, Baltimore, for a 1-story machine shop, to be built at a cost of \$50,000. It is understood construction will be deferred until the first of the year.

The American Propeller & Mfg. Co., Gittings and Covington streets, Baltimore, has acquired about 87 acres near Elkridge, Md. No announcement has been made as to when the property will be used. Spencer Heath is president of the company.

The International Shipbuilding Co., Pascagoula, Miss., plans to enlarge its plant. It has acquired four acres of land, and is reported to be planning to install new equipment, including cranes, tracks, lathes, etc.

Oscar Daniels, Tampa, Fla., will rebuild his shipyard which was recently damaged by fire. The loss was estimated at between \$20,000 and \$25,000.

The Acme Operating Corp., 3 East Lexington street, Baltimore, ship chandler, has been chartered by Frank E. Welsh Jr., Jacob S. Hopkins and R. M. Lee Young.

The Globe Ship Repair & Marine Supply Co. of New York, Inc., recently was incorporated at Wilmington, Del., with a capital stock of \$300,000, to own and operate boats, etc.

New Trade Publications

WELDING AND CUTTING APPARATUS.—Various details of welding and cutting apparatus are described in a catalog recently issued by the Bastian-Blessing Co., Chicago. A concise description and an illustration of each unit is included in the booklet. It is pointed out that one of the salient features of its product is the elimination of a flash-back.

MARINE PUMPS.—The Worthington Pump & Machinery Corp., New York, has issued a 126-page catalog, illustrating and describing the many lines of pumping machinery which it builds for marine service, such as: ballast pumps, cargo oil pumps, general service pumps, fuel oil pumping system, boiler feed pumps, etc. The catalog discusses the design, construction and operation of each type. Valuable suggestions regarding the choice and installation on ship board of pumping systems are given.

MARINE HARDWARE.—W. & J. Tiebout, New York, recently issued an illustrated 512-page catalog in which they aim to give some idea of the extensive line of marine hardware they handle. Hundreds of articles are described including various anchors, all manner of bolts, latches, lights, locks, pumps, refrigerator locks, catches, etc., pulleys, stateroom fittings, capstans, cleats, etc.

BOILERS.—A catalog describing boilers has been issued by the Foster Marine Boiler Corp., New York. The catalog treats of such subjects as the evolution of modern marine boilers; detailed descriptions of the marine water-tube boiler and superheater made by the company; miscellaneous data from government tests, suggestions for the installation, operation and maintenance of marine watertube boilers; and a list of vessels fitted with these boilers. The catalog is well illustrated and contains several line drawings showing details of parts.

PNEUMATIC DRILLS.—A catalog describing pneumatic drills has recently been issued by the Independent Pneumatic Tool Co., Chicago. The catalog is replete with illustrations and descriptive text. Several recent additions to its line are included in the book, such as: motor driven air hoists, pneumatic sand rammers, universal vise for pneumatic drills, hose coupling, power screw driver, hose clamp, and hose mender.

CRANES.—The Wellman-Seaver-Morgan Co., Cleveland, has issued a booklet describing by means of photographs and blueprints its line of special cranes, which includes pontoon cranes for marine work, dock cranes, shipbuilding cranes, cranes for concrete handling, etc. This company has also issued

similarly compiled bulletins on coal and ore handling machinery, and port and terminal equipment.

OIL ENGINES.—The Winton Engine Works of the Winton Co., Cleveland, recently issued a handsome booklet in which the construction details and principles of operation of its diesel oil engines are described. The booklet contains a number of engine views and several illustrations of vessels on which these engines are installed. A list of general specifications of the oil engines is also included.

PROTECTIVE COATINGS.—An interesting illustrated booklet has been issued by the Briggs Bituminous Composition Co., New York, covering its protecting coatings for ships and for iron and steel. The value of bituminous coatings as a solution of the corrosion problem is pointed out and explained. A list of well known companies using these products is included in the bulletin. Specifications for steamships are given. The booklet should prove of interest to shipbuilders, owners, and operators.

RANGES.—Farrell & Curry, Buffalo, have issued a 4-page booklet illustrating some of their marine range models. It is claimed that the use of the direct draft giving direct outlet to smoke pipe is a valuable feature in eliminating the accumulation of soot.

NAVIGATIONAL INSTRUMENTS.—A booklet recently was issued by the Kelvin & Wilfrid O. White Co., Boston, which contains illustrations of the company's navigational instruments and equipment. These include compasses of various types, chronometers, sextants, sounding machines, binnacles, pelorus, telescopes, barometers, barographs, fog horns, ship logs, clocks, etc.

STEAM HOISTS.—The Lidgerwood Mfg. Co., New York, has issued a 52-page illustrated catalog in which its hoisting engines are fully described. Single, double, and triple-drum hoisting engines are among the types described.

CAPSTANS.—The American Engineering Co., Philadelphia, has issued an attractive booklet, illustrating and describing its complete line of capstans and gypsies. Power types include steam, electric and gasoline drives. Hand power, crank, cavel, and ratchet type capstans are also described. An illustration of each unit is included.

TACKLE BLOCKS.—The line of malleable iron and steel shell tackle blocks manufactured by the Parish Supply & Mfg. Co., Chicago, is described in a new catalog. The booklet describes the importance of proper design, construction and wearing qualities of tackle blocks, and aided by illustrations, outlines the company's manufacturing processes. The different types of blocks included in the company's line are illustrated and described at length.

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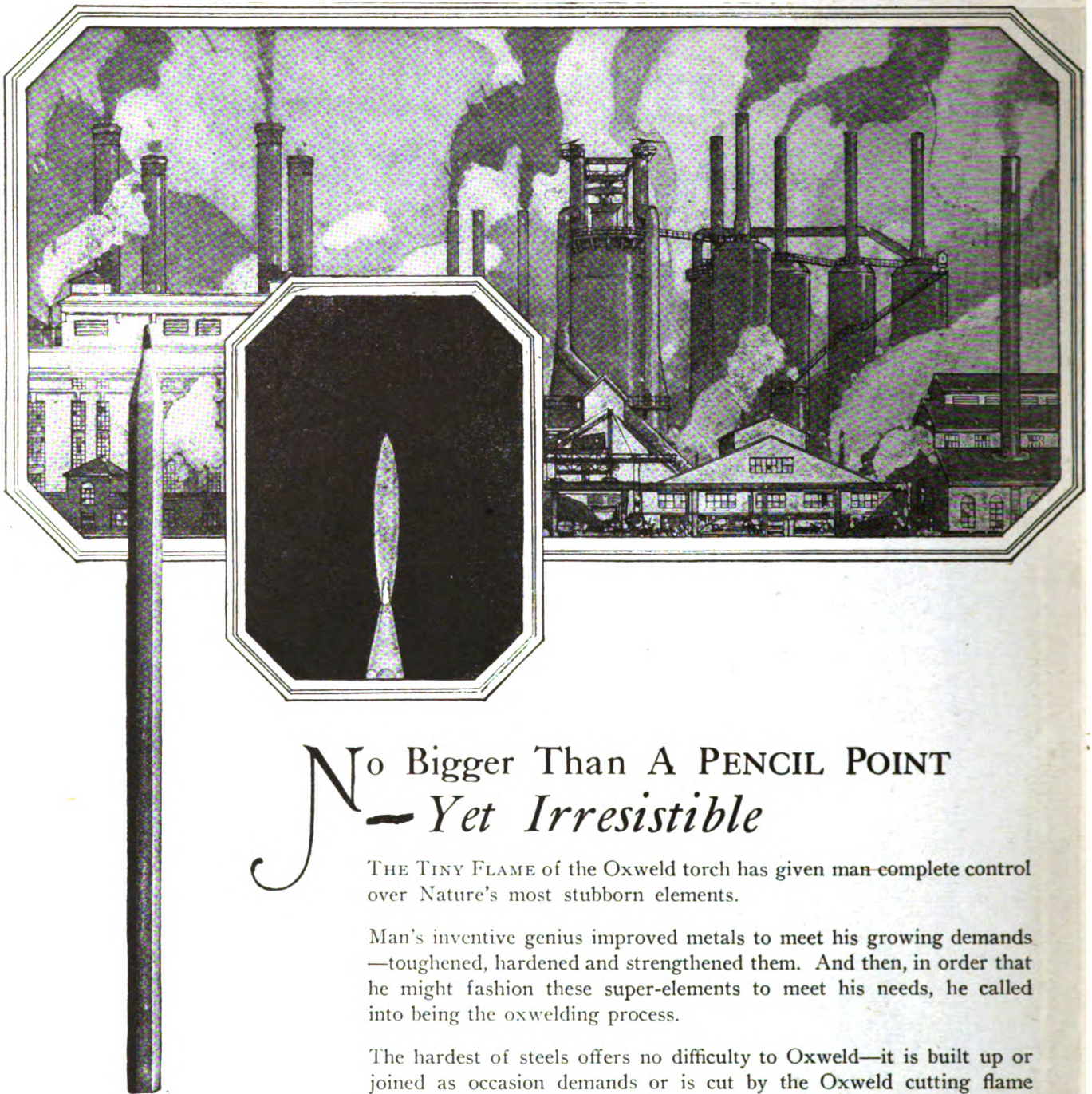


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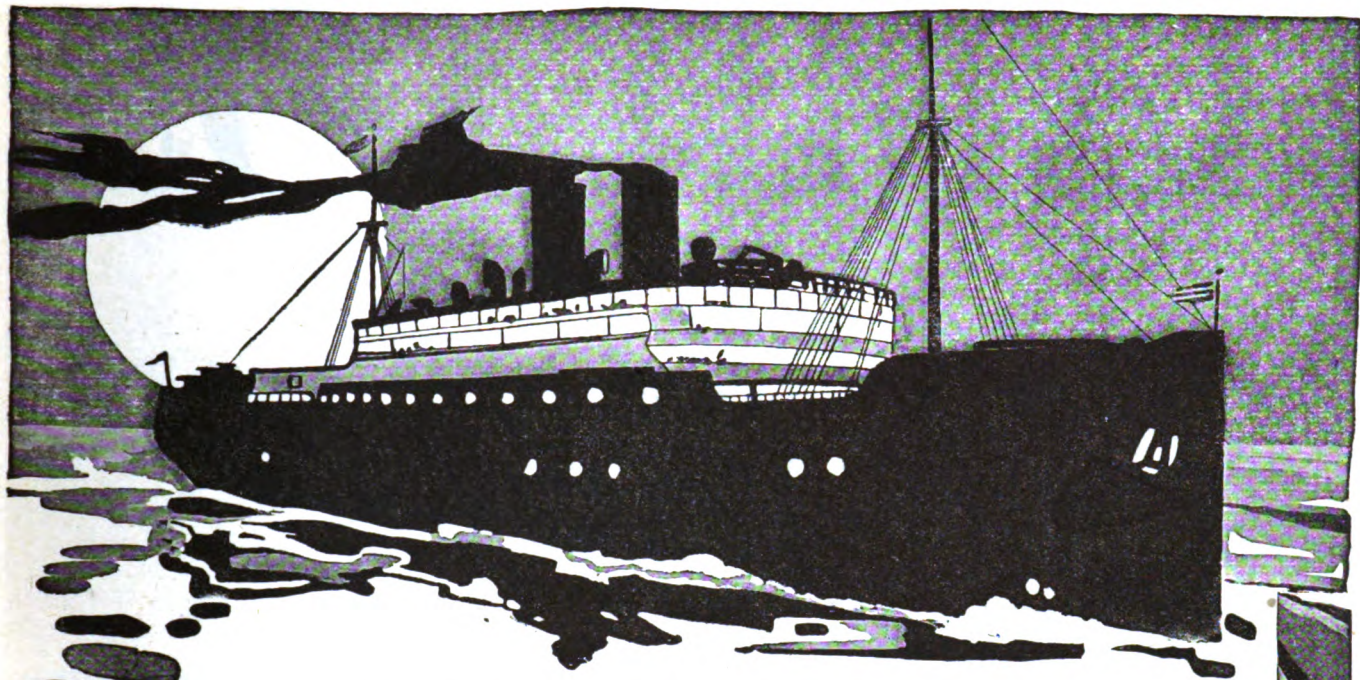
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NEW YORK—CLEVELAND, DECEMBER, 1920

THE MARINE REVIEW

Registered U. S. Patent Office

A Monthly Publication Devoted to Shipbuilding, Marine Engineering and the Business of Transportation by Water.

Published by the Penton Publishing Co., Cleveland, Ohio, U. S. A.

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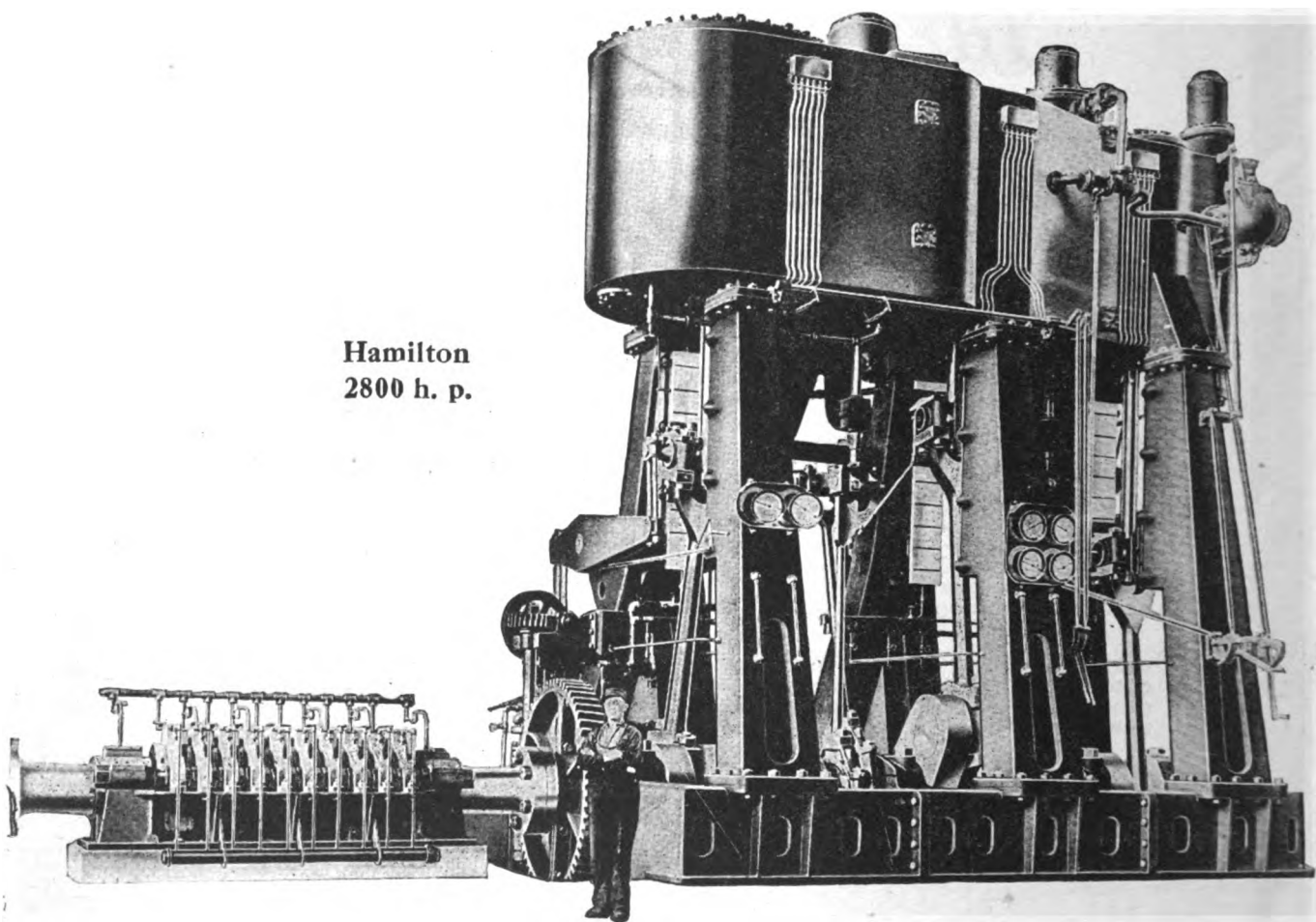
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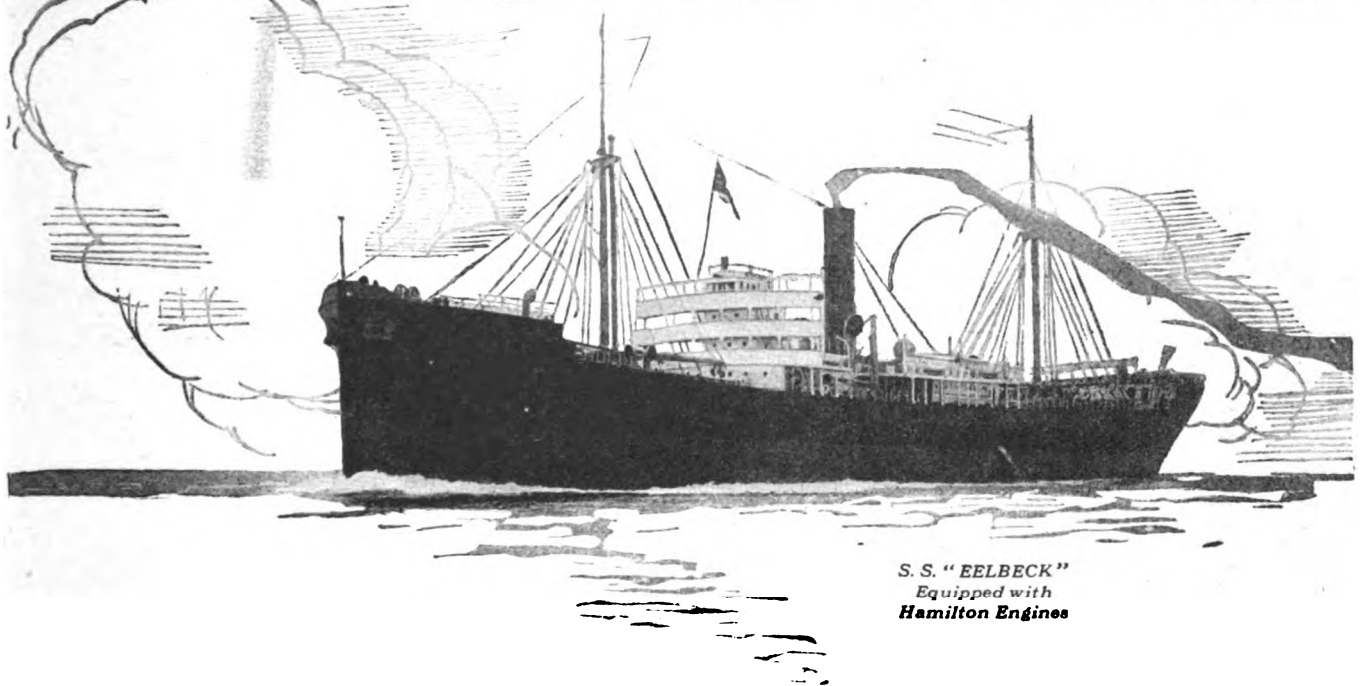
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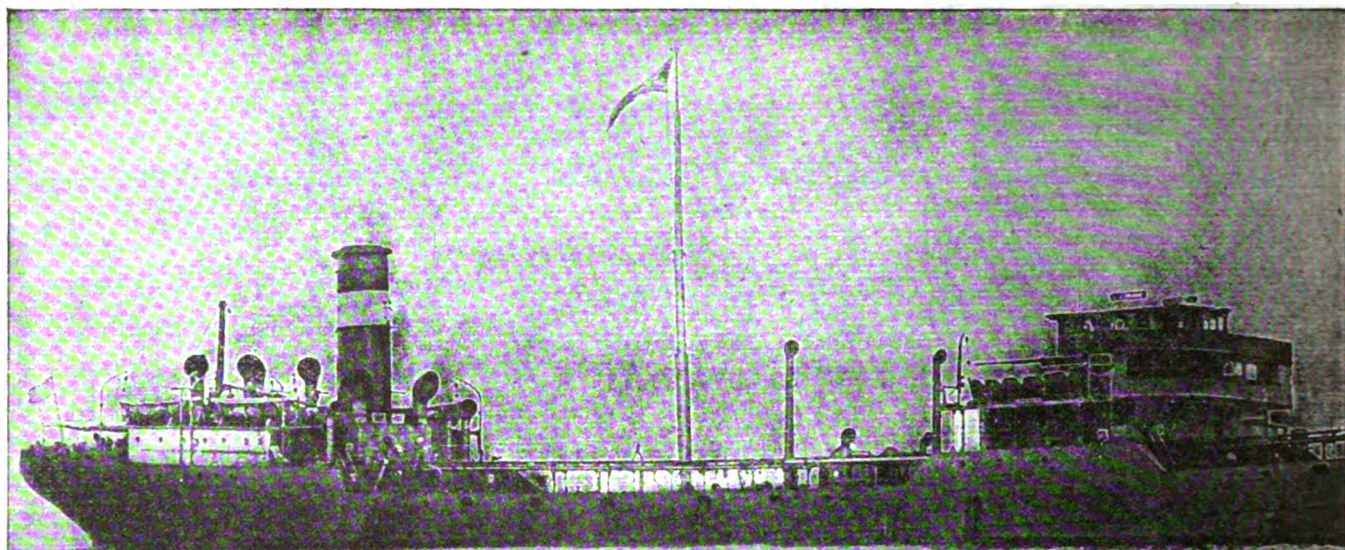
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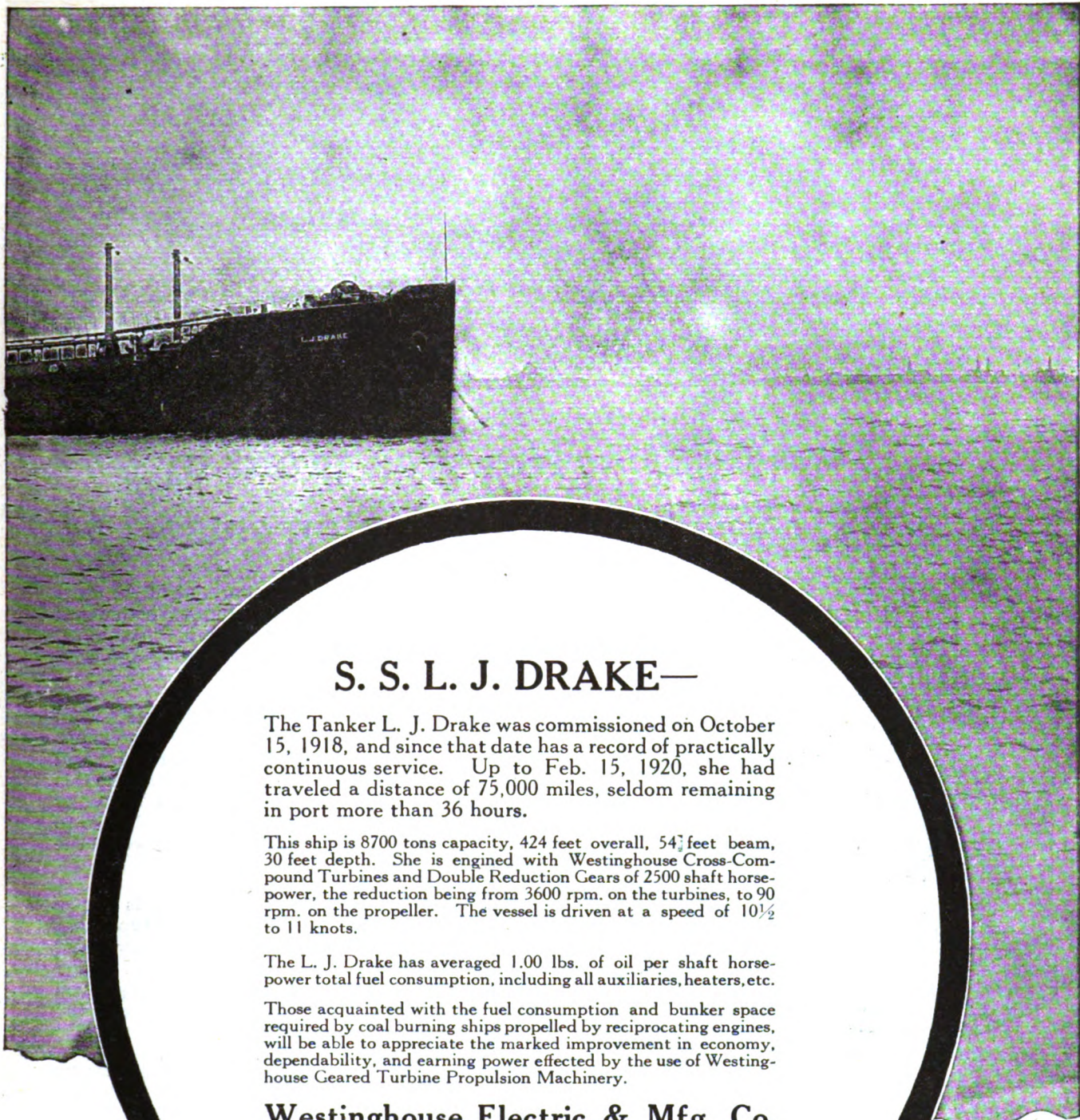
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The Tanker L. J. Drake was commissioned on October 15, 1918, and since that date has a record of practically continuous service. Up to Feb. 15, 1920, she had traveled a distance of 75,000 miles, seldom remaining in port more than 36 hours.

This ship is 8700 tons capacity, 424 feet overall, 54½ feet beam, 30 feet depth. She is engined with Westinghouse Cross-Compound Turbines and Double Reduction Gears of 2500 shaft horsepower, the reduction being from 3600 rpm. on the turbines, to 90 rpm. on the propeller. The vessel is driven at a speed of 10½ to 11 knots.

The L. J. Drake has averaged 1.00 lbs. of oil per shaft horsepower total fuel consumption, including all auxiliaries, heaters, etc.

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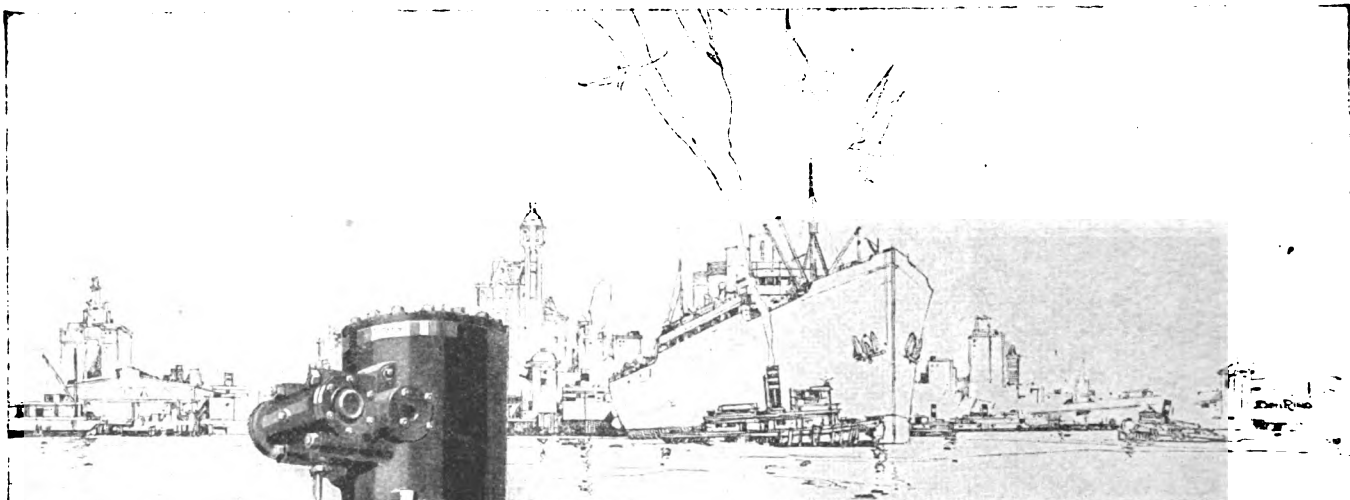
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Harrison, N. J.

Laidlaw Works, Cincinnati, Ohio.

Hazleton Works.

Hazleton, Pa.

Gas Engine Works, Cudahy, Wis.

Power & Mining Works

Cudahy, Wis.

Snow-Holly Worl

Buffalo, N. Y.

Epping-Carpenter, Pittsburgh, Pa.

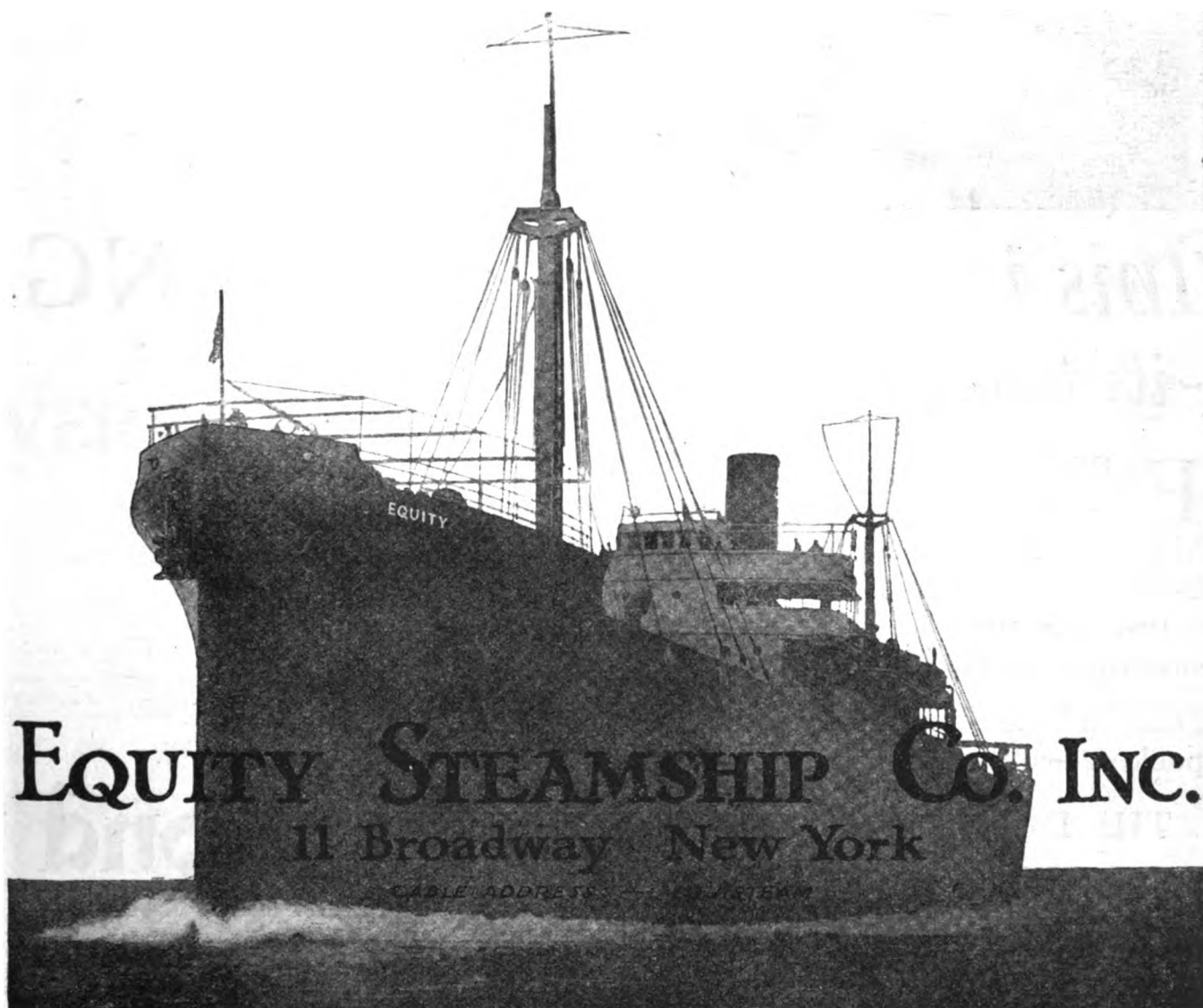
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OVER THE SEVEN SEAS

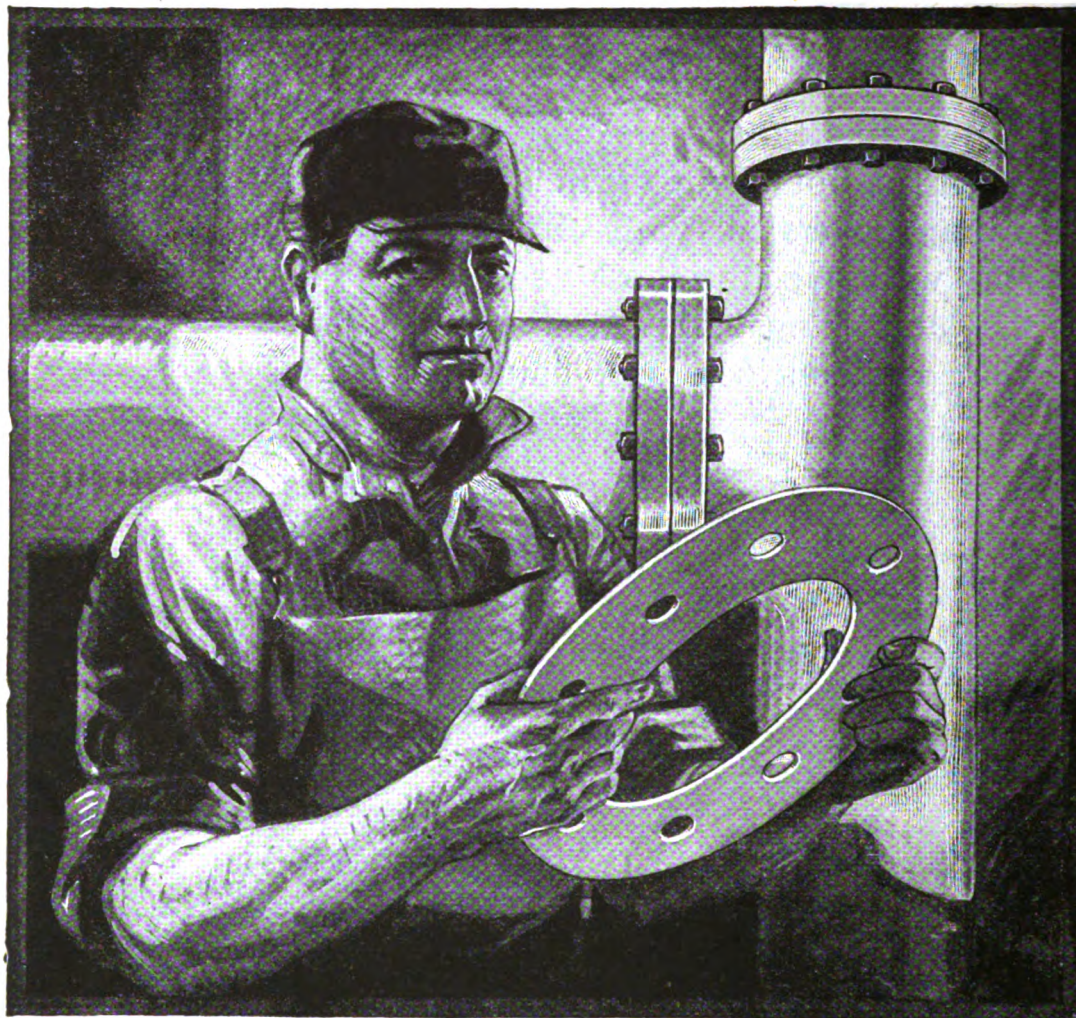
American steamers are carrying cargo which we found for them. Our organization covers all parts of the world and we have the best facilities for the chartering, sale or purchase of your steamers wherever they may be.



**WE SPECIALIZE IN
FOREIGN CHARTERING**



Please mention THE MARINE REVIEW when writing to Advertisers



This is ELBON PACKING *-it's tested to 800 lbs.*

ELBON is the nearest thing to perfection in super-heat packing. Made from especially mined, long fibre asbestos and highest quality rubber, it is tested to 800 pounds—a greater pressure than any packing is asked to sustain.

Diamond was the first to make super-heat packing—and is first to-day with Elbon.

THE DIAMOND RUBBER CO.

Incorporated

Akron, Ohio

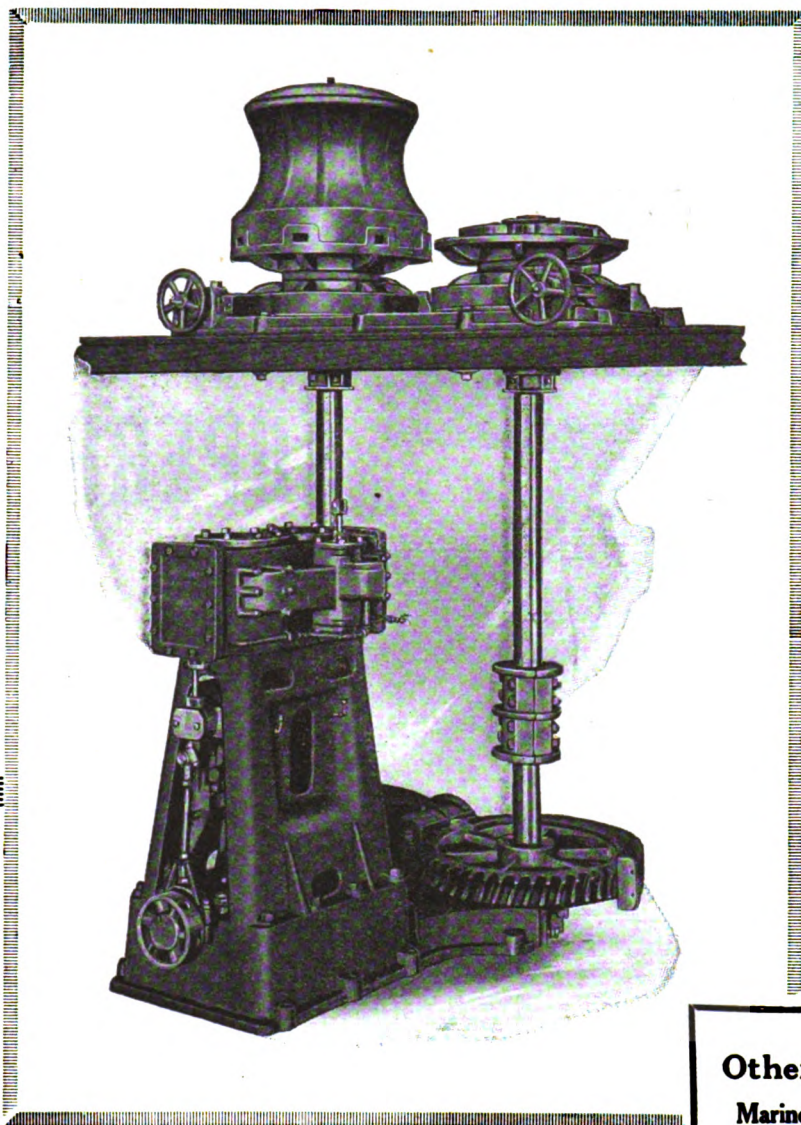
Diamond **PACKING**



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**Built
Right**



**Runs
Right**

THE "SUPERIOR" VERTICAL WINDLASS

The illustration above shows our 9" x 9" double cylinder Throttle Reverse Windlass.

We are prepared to furnish this same type of windlass with either larger or smaller cylinders, and also with link reverse if desired.

This type of windlass is used extensively for battleships, cruisers, mineplanters and merchant vessels.

A request will bring full details.

SUPERIOR IRON WORKS CO.
SUPERIOR, WIS.

Designers and Builders of
"SUPERIOR" ENGINES AND MACHINERY

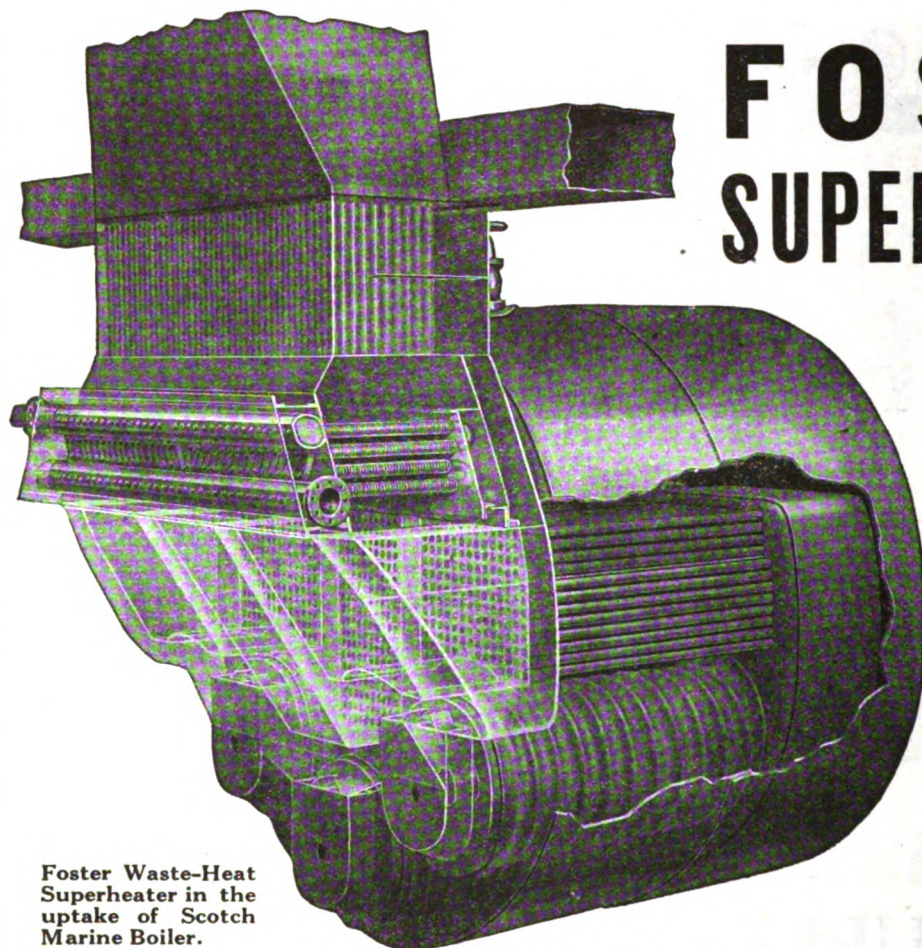
Other "SUPERIOR" Marine Auxiliary Machinery

Windlasses
Steering Engines
Hand Steering Gears
Capstans
Gypseys
Cargo Winches
Mooring Winches
Power Pawl Posts
Hoisting Engines
Swinging Engines
Dredge Deck Engines
Anchor Hoists
Scow Winding Gears
Drill Frame Hoists
Suction Pipe Hoists
Steel and Wooden
Derricks.

*Steam or
Electrically Driven*

How 38 deg. of superheat saved 10 percent of fuel

FOSTER SUPERHEATERS



Foster Waste-Heat
Superheater in the
uptake of Scotch
Marine Boiler.

A typical example of the decidedly worth-while saving in fuel accomplished by moderate superheat was shown during the recent trip of a 9000-ton Foster Superheater-equipped cargo ship. This vessel is fitted with a 3500 I. H. P. reciprocating engine, 3 Scotch marine boilers 14 ft. dia. x 11 ft. 6 in., and has Foster Waste Heat Type Superheaters for 40 deg. superheat.

Twenty four hours after the ship left the dock the superheaters were by-passed, and the engine was run for 3 days with saturated steam, averaging 182 barrels of oil per day. In the next 3 days, the superheaters were put in the line, superheating the steam 38 deg. With the same ship's crew maintaining all other operating conditions as before, the average fuel consumption was 163 barrels per day.

The actual saving in fuel accomplished by 38 deg. of superheat was 19 barrels of oil per day, or over 10 percent.

We are prepared to show you just how much Foster Superheaters can improve the fuel economy of ships in which *you* are interested. Send for the Foster Superheater Catalog and ask for full information.

Send for Bulletin M3

POWER SPECIALTY COMPANY

Foster Superheaters for Marine and Stationary Boilers and Locomotives

GENERAL OFFICES: 111 Broadway, New York

Boston

Philadelphia

Pittsburgh

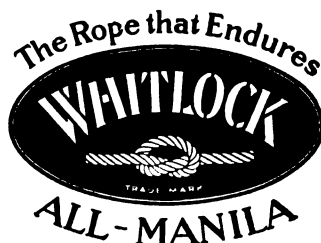
Chicago

San Francisco

London, England

WORKS: Dansville, N. Y., and St. Albans, Hertford, England

Please mention THE MARINE REVIEW when writing to Advertisers



Authorities Say:

"The Rope that ENDURES" will

"last—

"support without breaking—

"sustain without impairment or yielding."

(*Century Dictionary*)

"withstand—

"hold out against—

"bear the test without injury or giving away."

(*Funk and Wagnalls Dictionary*)

"I will endure wind and weather."—(*Shakespeare*)

WHITLOCK ALL-MANILA Is That Rope

Because it is not merely 100% Manila fibre, but 100% high-grade Manila fibre, superior to the requirements of the Bureau of Standard Specifications.

Because it exceeds those specifications in all other respects, including yardage, tare and strength.

Because it is made with extreme care and is guaranteed to give complete satisfaction.

"Either You Are Satisfied or We Are Not"

WHITLOCK CORDAGE COMPANY

46 South Street, New York

Factory and Warehouse:

Jersey City
N. J.

Branches:

Chicago, Boston, Houston
and Kansas City

Drill Ability For Any Job

The drill that has made the greatest progress of any pneumatic specialty that was ever developed.

Little David Drills have less parts, which means less chance for trouble. Each part is made relatively stronger. And besides, every part is readily accessible for inspection or overhauling.

Specify Little Davids for your drill needs and get machines that give you 100 per cent. performance.

Catalog 8000 Describes These Tools

Ingersoll-Rand Company

General Offices: 11 Broadway, N. Y. C.

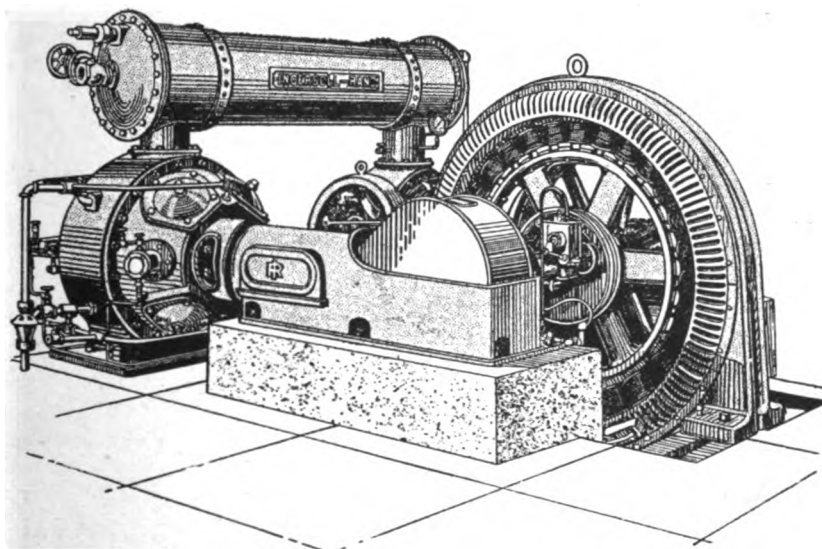


Ingersoll-Rand

182-PT

AIR COMPRESSORS

CLASS "PRE"



Your Ship and the Air Compressor

Thousands of cubic feet of compressed air are used in the building of a ship. Each cubic foot costs money and directly affects the builder's profit on his ship contract.

It pays to install air compressors which produce your air at the least cost per cubic foot actually delivered—taking into account the cost of repairs and loss due to interrupted service. The cheapest air is usually produced by the best air compressors.

Believing this to be the case, leading shipyards using electric power, specify Ingersoll-Rand "PRE" direct connected motor driven compressors. These compressors are fitted with Ingersoll-Rand plate valves, are automatically lubricated and are regulated by means of patented 5-step automatic clearance control.

We will be pleased to quote you on the complete unit—compressor with motor—and in the case of alternating current, with suitable exciter. In asking for quotations, kindly specify electrical conditions.

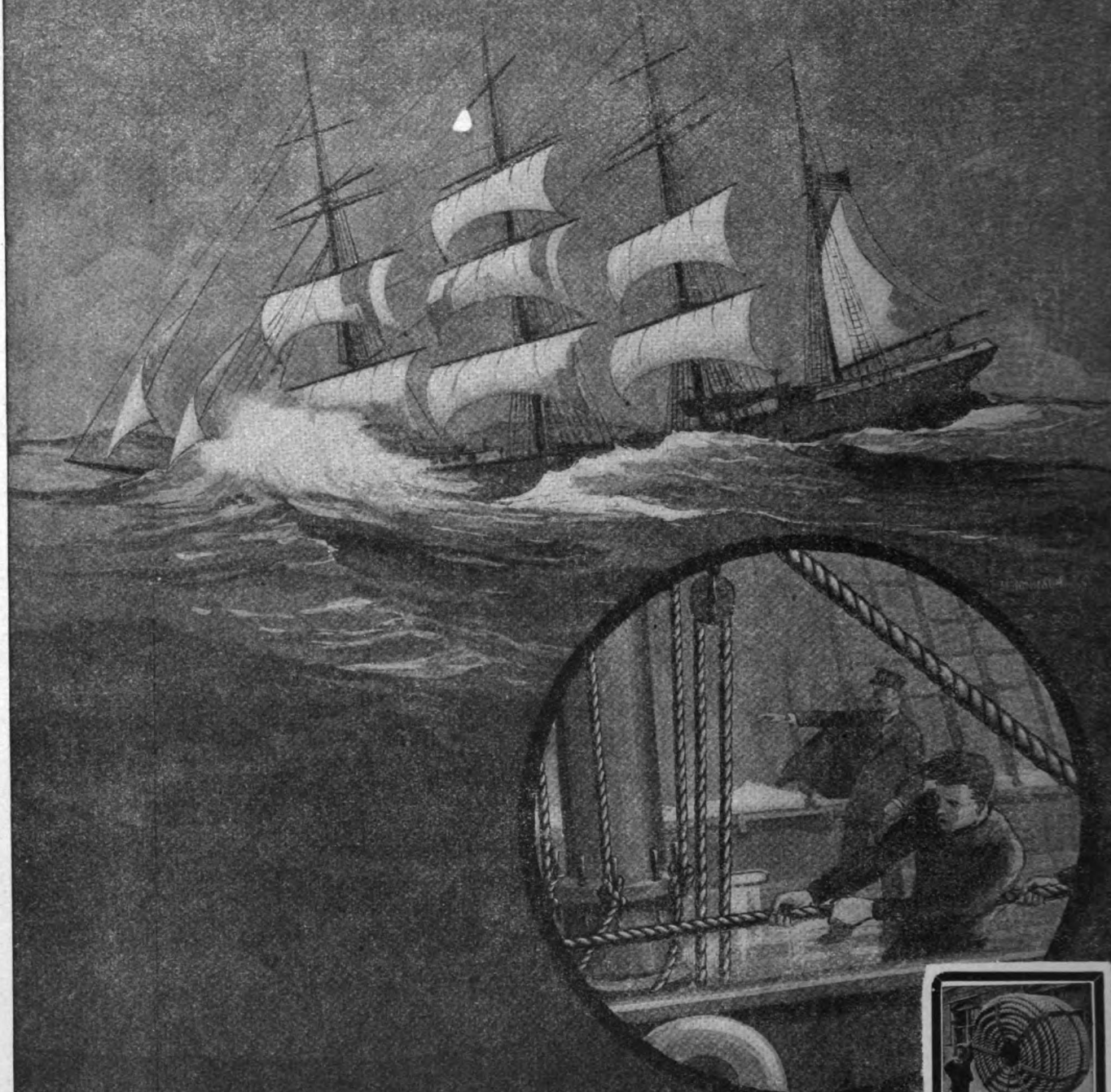
INGERSOLL-RAND COMPANY

11 Broadway, New York

483-C

Ingersoll-Rand

"AMERICAN" BRAND "THE RELIABLE ROPE"



AMERICAN MANUFACTURING COMPANY

LARGEST MAKERS OF COMMERCIAL TWINES AND ROPE IN THE WORLD

MILLS & SALES OFFICE: NOBLE & WEST STREETS, BROOKLYN, NEW YORK CITY

WESTERN BRANCH: ST. LOUIS CORDAGE MILLS, ST. LOUIS, MO.



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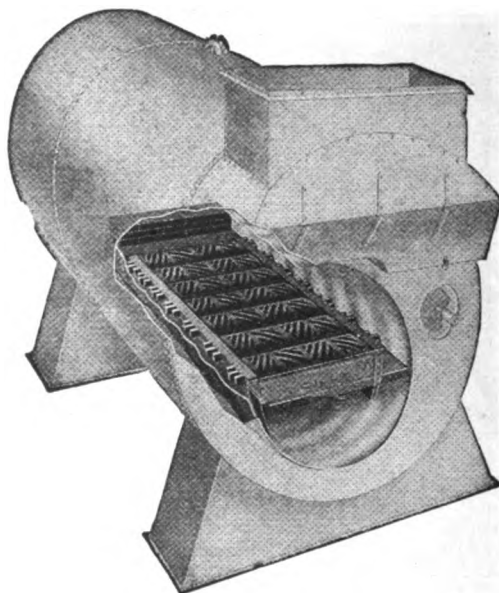
Specify **U.S.**
Stud Link Chain
It is durable-dependable
and - safe

We also manufacture
Steering Gear Chain - Hooks
Sling Chain - Cargo Chain
Chain Net - Towing Chains
- Marine Forgings -

Send us your inquiries

United States Chain & Forging Co.
Union Arcade Bldg.,
Pittsburgh, Pa.

*There would be no coal shortage
if everybody burned coal on*



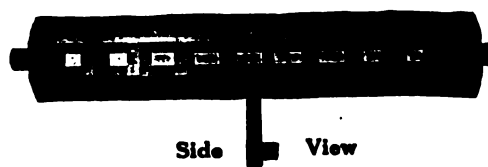
Thomas



Wiggling-Shaking-Dumping GRATE BARS



Bottom and End View of
Bar Showing Structure



Side View

WHY

Isn't it more logical to clean a fire-bed from the bottom? A bed of fuel burns upward, leaving the burnt refuse at the bottom. The Thomas Grate removes this refuse without disturbing the fuel bed—without producing holes, seams and pockets.

A simple short stroke of the hand-lever removes the light dust. A little longer stroke shakes out the rock and clinkers. A full stroke dumps the entire contents. Cleaning periods are banished.

For Use With Either Natural, Induced or Forced Draft
For Detailed Information Write

THOMAS GRATE BAR CO., Birmingham, Ala.

Hippodrome Building, Cleveland, Ohio
2 Rector St., New York

Sales Offices:

Railway Exchange Building, Chicago, Ill.
617 Bienville Street, New Orleans, La.

CONDULETS



**Utilizing Shore Current
for Auxiliaries**

TYPE BRHD plug receptacle equipment meets a requirement of marine work, in that it provides a means for easy and quick utilization of shore current for lighting or power purposes aboard vessel while in port or in dry dock.

The equipment is designed to be mounted in 4" conduit, and can be installed equally well on wharf, dry dock or vessel.

Send for Condulet catalog showing complete lines of Marine Condulets.

CROUSE-HINDS COMPANY
SYRACUSE, N. Y.
BOSTON NEW YORK CHICAGO

Condulets Panelboards
Knife Switches Floodlights
Guy Anchors
1604

*Condulet
the Job*

BRHD

BRHD PLUG RECEPTACLE
equipment is thoroughly gasketted and designed for severe service.

CROUSE-HINDS

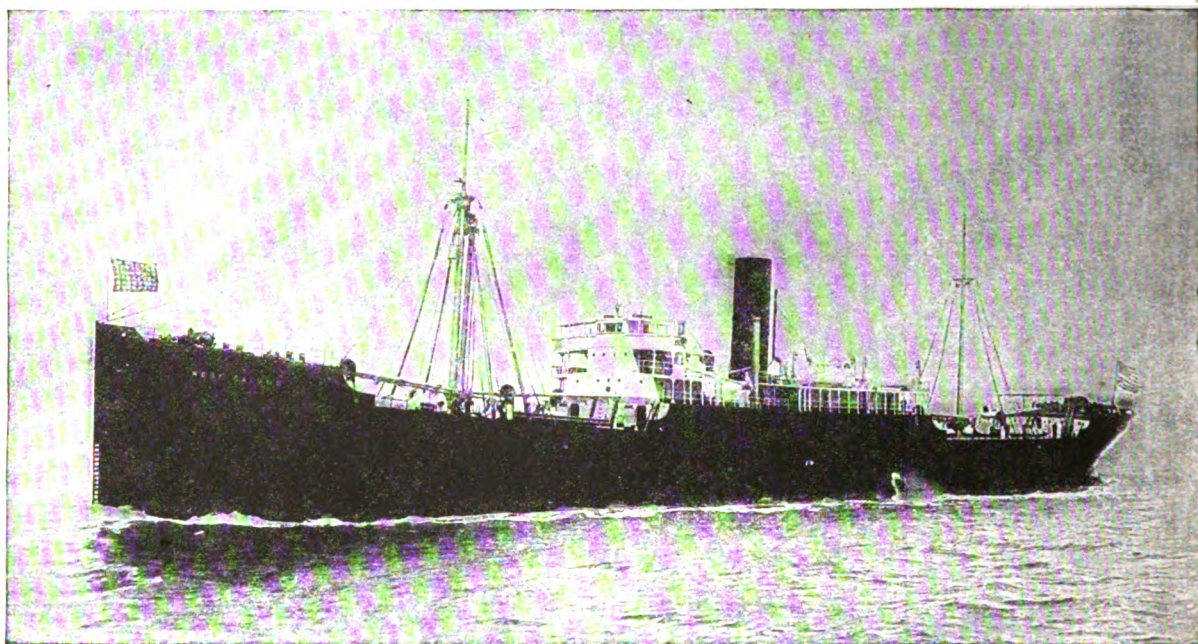


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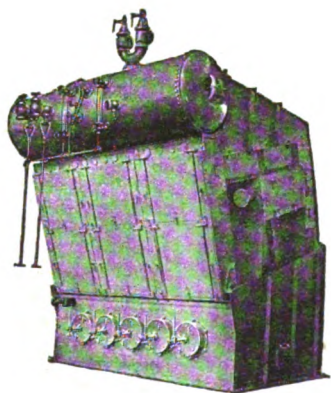
The Marine Water-tube Boiler

has proven its case



S. S. West Calumb, one of 22 sister-ships built by Los Angeles Shipbuilding & Dry Dock Co., each fitted with 3 Foster Marine Water-tube Boilers

The Great War helped to establish firmly the advantages of the Marine Water-tube boiler. All tests made by the U. S. Navy and the Emergency Fleet Corporation and operating records of ships built before and during the war showed conclusively the marked superiority of this type of boiler over the Scotch Marine type. Today, only water-tube boilers are used in the U. S. Navy, and the proportion of this type of boiler on merchant ships is rapidly increasing.



**FOSTER
MARINE
BOILER
CORPORATION**
111 BROADWAY, NEW YORK

FOSTER MARINE BOILERS

are doing their share to demonstrate the many superior features of water-tube boilers. We now have ample data from more than one hundred installations to prove lower first cost, less weight, lower operating cost and longer life than could be obtained with Scotch boilers even in the most favorable conditions. And marine engineers who have used Foster Marine Boilers testify to their simplicity and ease of operation, low maintenance expense, and ready adaptability to any practical degree of superheat for improved economy with turbines or reciprocating engines.

The new Foster Catalog—just off the press—is the last word on marine boilers and well worth reading. May we send you a copy?



A diver being raised to the deck after a record-breaking descent in a steel suit weighing hundreds of pounds

When We Raid Davy Jones' Locker

A LEADING maritime expert has said that when the United States establishes a large merchant marine it must, to obtain reasonable insurance rates, maintain an efficient salvage division.

Salvage brings instantly to mind the diver. And the diver's life and efficiency rests almost entirely on the hose that brings him air. When you stop to consider that the pressure 280 feet below water is 270,000 pounds to the square inch (marine figures), and the diver is able to withstand this force only through the vacuum created, you can see why no end should be spared to get hose that is absolutely dependable.

Such hose is Goodrich Divers Hose. For a half-century we have been making hose—and no single piece is studied and worked with more care than divers hose. Not only does the best rubber and fabric go into it—but we incorporate a rubber vitality that assures the same safety after months of service as when first used.

Apart from our high standard grade, we build to specifications when asked.

*Goodrich makes hose
for all marine purposes*

Goodrich Divers Hose

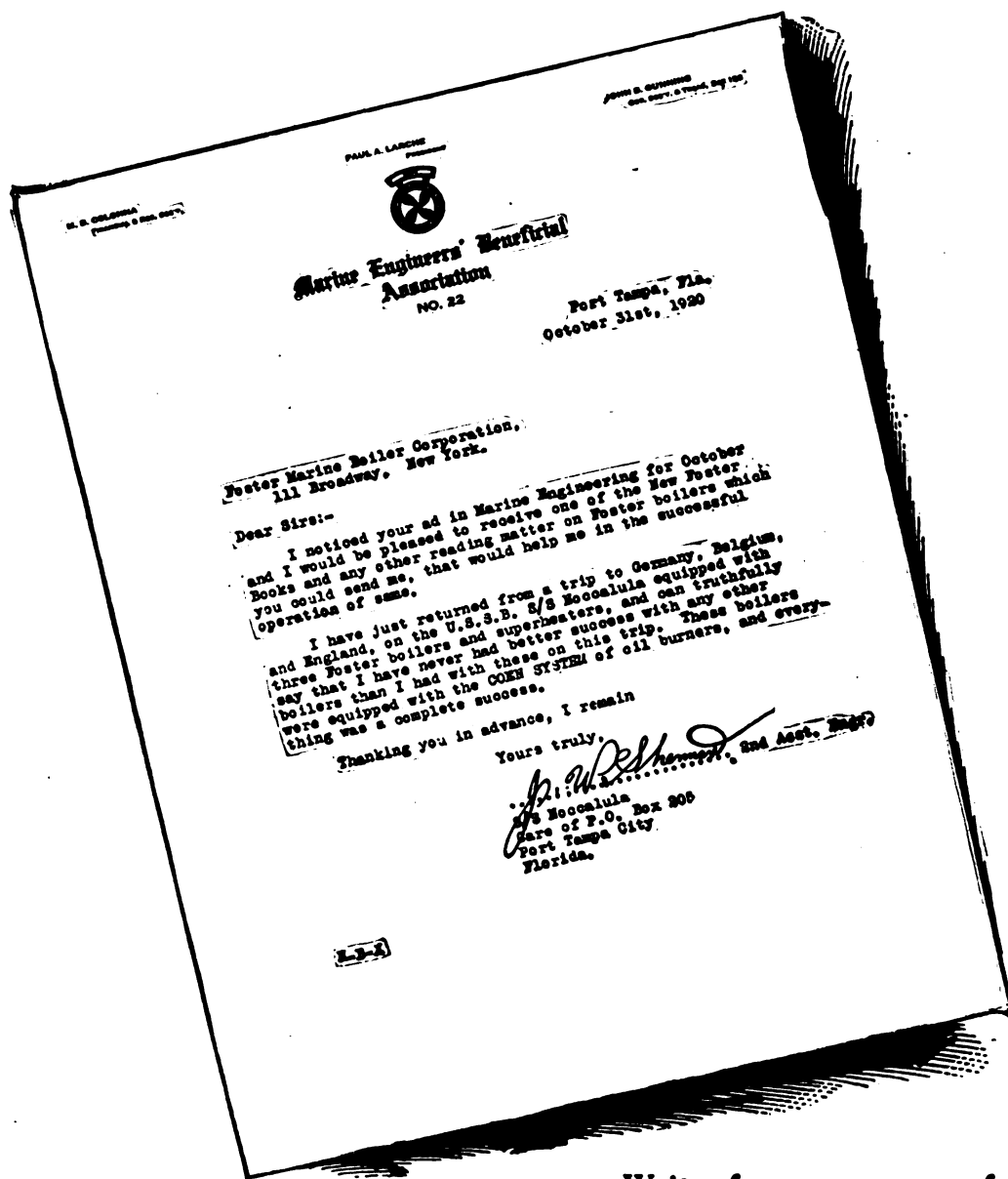
THE B. F. GOODRICH RUBBER COMPANY
Akron, Ohio



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The experience of one operating engineer with **FOSTER MARINE BOILERS**



Write for your copy of the new FOSTER Book. It shows why hundreds of other engineers are securing equally good results with their FOSTER Boilers.

FOSTER MARINE BOILER CORPORATION

111 Broadway, New York

Branch Offices—Boston, Philadelphia, Pittsburgh, Chicago, San Francisco, London, Eng.
Works—Edgemoor, Del., Oil City, Pa., Springfield, Ill., Portland, Ore.

Please mention THE MARINE REVIEW when writing to Advertisers



Are *YOU* Responsible for Vessel Operating Costs?

If you are responsible for vessel operating costs—and you *ARE* responsible if your position is that of owner, manager, superintending engineer, chief engineer or assistant engineer—you will want this book.

It discusses the marine boiler-room problem from the point of view of the man who must show profits at the end of the year. Fuel consumption charts, records of boiler tests, and bookkeepers ledger sheets are shown.

In particular, the book deals with one big profit-absorbing loss—SOOT. Soot as found in marine boilers is the best heat insulator known. It is five times as effective as asbestos in preventing heat

transference. It is the black profit taker—causing an average direct loss of 100 lbs. of fuel out of every ton burned.

Finally, the book describes Diamond Soot Blowers and their functions and performance in the elimination of soot losses, which cost the steamship operators of the country millions of dollars annually in needlessly burned coal and oil.

This book is yours for the asking, just pencil your name on the coupon.

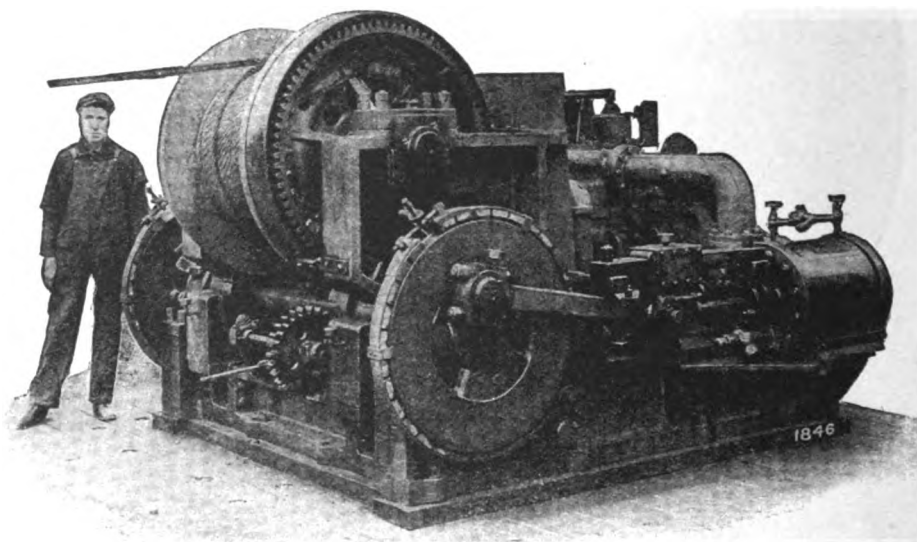
Diamond Power Specialty Company
Detroit, Michigan

Please send my copy of "How Some Shipowners Have Increased Their Profits" to

Name _____
Address _____
Firm _____
No. Boilers _____
Type _____
M. R. _____

Diamond Power Specialty Co., Detroit

LIDGERWOOD STANDARD WINCHES



The 13" x 13" Automatic Tension Towing Engine with 1¼" hawser
Normal pull 18,000 to 20,000 lbs.

The Lidgerwood Towing Engine is Jerk-Proof

BECAUSE any material increase of hawser pull instantly decreases the steam pressure (in cylinders) — yields hawser — prevents **JERKS**, and

BECAUSE any material decrease of hawser pull instantly increases steam pressure — winds in hawser — prevents **SLACK**.

THEREFORE the hawser pull is steady, varying slightly; and small hawsers are used, which offer slight resistance in dragging through seas.

SAVES MONEY in cost of hawsers.

SAVES TIME because the tow goes faster.

SAVES FUEL. Example: Towing a ship with 16,600 lbs. pull at seven knots speed requires 133 horsepower more to drag a 2" diameter hawser 2000 feet long through the sea than a 1½" hawser 1000 feet long. Such small hawsers permissible *only* with Lidgerwood towing engines.

Send for catalog **THE AUTOMATIC TENSION ENGINE.**

BRANCHES: Chicago, Cleveland, Detroit, Pittsburgh, Philadelphia, Seattle, Los Angeles, London, England

LIDGERWOOD

MFG. CO., 96 LIBERTY ST., NEW YORK, N.Y.

MARINE GEARS



Single Reduction Gear Unit
with Thrust Bearing for
Twin Screw Passenger Ships
6000 S.H.P., 1800 to
125 R.P.M.

Consult Our Engineering Department

FALK GEARS are built for Compound Turbines—Single or Double Reduction or for Diesel Type Marine Engines—Single Reduction.

No matter what your gear problem may be, we can solve it, *exactly*.

Do you know that we have already built gears for the *marine field*, aggregating more than 3,000,000 H. P.?

And we recently closed contracts for furnishing *Falk Turbine Gears* for a fleet of fifty new vessels.

If you need gears, let us make them.

You'll find that it will pay to have your Marine Gears made by Marine Gear Specialists.

Let us talk to you.

THE FALK COMPANY

MILWAUKEE, WIS., U. S. A.

W. O. Beyer
1007 Park Building, Pittsburgh, Pa.

M. P. Fillingham
50 Church Street, New York City

F. W. Grimwood
Rialto Building, San Francisco, Cal.



LUDLUM

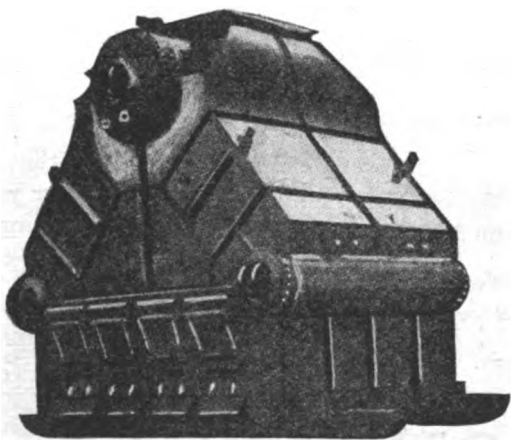
FORMERLY THE COLVEN
WATER TUBE
MARINE BOILER
The New Marine Standard

A Self-Contained Unit:—

Assembled and properly erected in the shop, this boiler goes to the ship complete and ready for steam. This saves the slow, costly, and often careless work of erecting the ordinary knocked-down boiler in the hold of the vessel. Units up to 3000 square feet of heating surface can be shipped intact and swung bodily on board ship.

Quick deliveries assured by ample stocks of materials on hand.

Write for the Catalog.



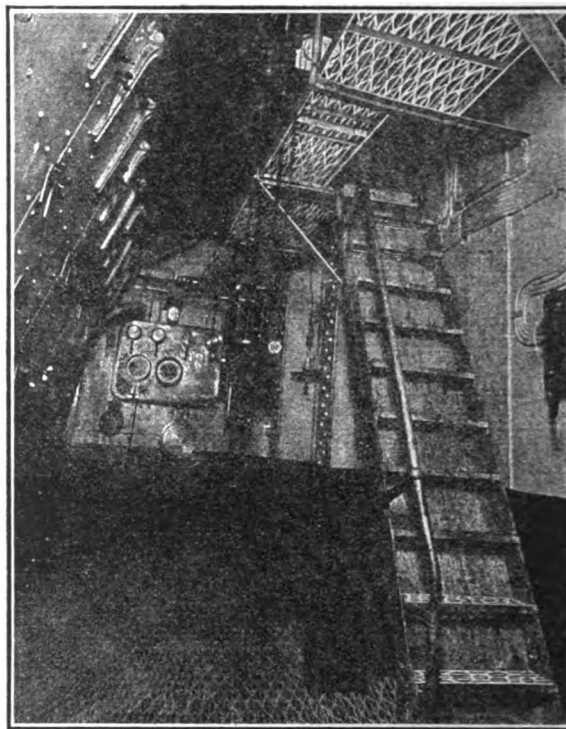
NEW YORK ENGINEERING CO.

2 RECTOR STREET, NEW YORK

Works at Yonkers, N.Y.



TRADE MARK
IRVING SUBWAY
(PATENTED) REG. U.S. PAT. OFF.
THE FIREPROOF VENTILATING FLOORING



Irving Subway for floors, Irving Walkways and Irving Safesteps, in one of the new U. S. battleships.

The hold, boiler room and engine room of a ship are hot, stuffy places, to say the least. So why permit solid floors, galleries and stairs to shut off ventilation? Eighty per cent of the area of an Irving Subway panel is open space—ventilation area. Yet it is as strong and rigid, as easy to walk or work or wheel upon, as a solid plate of iron—with only a fraction of the weight.

The convenient size of the panels makes it easy to cover an area of any size and shape. There is no recorded instance of Irving Subway wearing out. It has an absolutely non-slipping surface always.

Think of floor ventilation. Then remember that you cannot buy a better, stronger and less expensive ventilating flooring than Irving Subway.

Let us send you Catalog 2A12

IRVING IRON WORKS CO.
LONG ISLAND CITY, N.Y., U.S.A.

Workers in Iron and Steel to Quality Standard, and Manufacturers of

TRADE MARK
IRVING SAFSTEP
(PATENTED)
ABSOLUTELY NON-SLIPPING ALWAYS

DUNN ANCHORS

TO embed itself, the anchor, instead of plowing up the sea bottom, must permit the soil to close in around it.

Curved lines and rounded surfaces on the Dunn Anchor make positive this desirable action. The flukes have ample holding surface and are set at the correct angle to give maximum holding power.

We also make mushroom and stocked anchors.

American Steel
Foundries

New York Chester, Pa.
CHICAGO



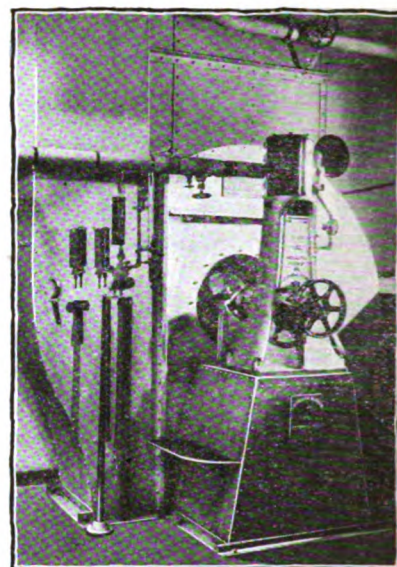
VENTILATING THE MODERN SHIP

The preservation of the cargo, the health and comfort of passengers and crew, and often even the longevity and usefulness of the ship itself, depend upon the thoroughness and efficiency of the ship's ventilating system. Air must be sent to the farthest recesses of the ship's structure, as part of its function is to keep the interior dry, thereby eliminating all cumulative precipitation. Climatic conditions, to which every sea going ship is subject, demand forced and positive ventilation for the good of the entire ship and its efficient operation.

The mechanical draft for the ship's power plant is also a necessary factor. The over-all efficiency of *Sirocco Mechanical Draft* far exceeds the efficiency of ordinary draft. It greatly lowers stack foundation cost, fuel cost, the size of the boiler plant, and the Btu. return per dollar of fuel cost.

Where it is a question of forced or induced draft, or of ventilating equipment in general, the *Sirocco Engineering department* will gladly give you the benefit of their experience. May we help you solve your problems?

Write for our bulletin "A. B. C. Equipment for Ships".



A B C Engine and Sirocco Blower
for Ship Ventilation

American Blower Co.
Detroit, Mich.



PROGRESS IN RADIO DEVELOPMENT



THE vast experience of the great Research Laboratories of the General Electric Company in the design, development and manufacture of Vacuum Tubes for Radio telegraphic purposes is now at the disposal of the RADIO CORPORATION OF AMERICA.

The policy of this Corporation has been to supply steamship owners with RADIO apparatus embodying the latest advancements in the art of wireless communication.

THE RADIO CORPORATION has under development a complete line of CONTINUOUS WAVE TRANSMITTERS of the *Vacuum Tube Type*, which will combine in one set *three* different classes of Radio Transmission. These are:

CONTINUOUS WAVE TELEGRAPHY
MODULATED CONTINUOUS WAVE TELEGRAPHY
RADIO TELEPHONY

These sets, incorporating in one unit three different classes of RADIO transmission, permit communication with all classes of ships and shore stations.

The outstanding features of this new apparatus are:

Increased efficiency. Flexibility. Silent operation.
Ease of manipulation. Low cost of maintenance.

Twenty years of experience have been brought into the development and perfecting of the service of this Corporation. Ships carrying the wireless apparatus and service of the RADIO CORPORATION OF AMERICA bear one of the primary preventions against marine disaster, and the primary means of keeping in touch with important world affairs.



Ship Wireless may be bought outright, may be leased, and may be bought or leased in addition to our service of inspection, maintenance and operation. We provide licensed, skillful and trustworthy operators. Also our service and inspection depots are located at all important seaports of the world.

Our Nearest Office Will Give You All Details and Information

RADIO CORPORATION OF AMERICA

EDWARD J. NALLY, President

WOOLWORTH BUILDING

NEW YORK CITY

BRANCH OFFICES IN THE U. S. A.

BOSTON
NEW ORLEANS
SEATTLE

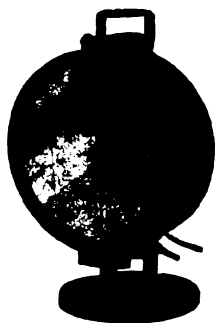
PHILADELPHIA
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BALTIMORE
PORT ARTHUR
SAN FRANCISCO

NORFOLK
CLEVELAND
SAN PEDRO

SAVANNAH
CHICAGO
HONOLULU

Western Electric
Portable
Utility Light



For Night Time Efficiency

Highest efficiency in nightwork can only be obtained when the work is done in light bright enough to properly illuminate the work.

The Western Electric Portable Utility Light fully meets the demand for close range night illumination within restricted areas where the light is to be located at distances not greater than 100 to 125 feet.

For
Shipyards

and
General
Marine Work

With this light operating on a 100 foot throw a 100 foot spread is obtained at an angle of 60 degrees.

It is very rugged in construction, weighs but 30 pounds, no tools are needed for adjustments and it can be carried wherever you want it.

We also have 500 and 1,000 watt Flood Lights if a bigger light is required.

Western Electric Company
Offices in All Principal Cities

Annual Shipbuilding *and National Marine Exposition* Number

February 1921

Shipbuilding Ship Operation Ship Maintenance

**A field that demands
your products**

Forms close Jan. 5

**Reserve your
space now**

MARINE REVIEW

Cleveland

New York

Superiority— unfailing performance —service



*The original
Regrinding Valve*

AMERICA'S BEST
LUNKENHEIMER
—QUALITY—
SINCE 1862

LUNKENHEIMER REGRINDING VALVES

have firmly established their unparalleled merit by the successful results they have given through many years of satisfactory service.

The metal to metal seat—ground to a tight fit, forms the ideal seating surface to resist the wearing action of steam at high velocity. And the fact that the seating surfaces can be reground (an inexpensive operation easily accomplished) makes the renewal of parts wholly unnecessary.

Their extreme durability due to correctly proportioned parts, high quality materials and expert workmanship insures economy in maintenance.

Globe, Angle and Cross Valves with Inside Screw and with Outside Screw and Yoke; and Horizontal, Angle, Vertical and Swing-Check Valves for 200 and 300 pounds working steam pressure.

Specify Lunkenheim and insist on their installation. Distributors of Lunkenheim Products situated in every commercial centre.

Write for descriptive Booklet No. 517—FH.

THE LUNKENHEIMER CO.
—“QUALITY”—

Largest Manufacturers of
High Grade Engineering Specialties
in the World

CINCINNATI

New York Chicago Boston London



You're burning up money

if your average rivet spoilage by burning and scaling is the usual 15%

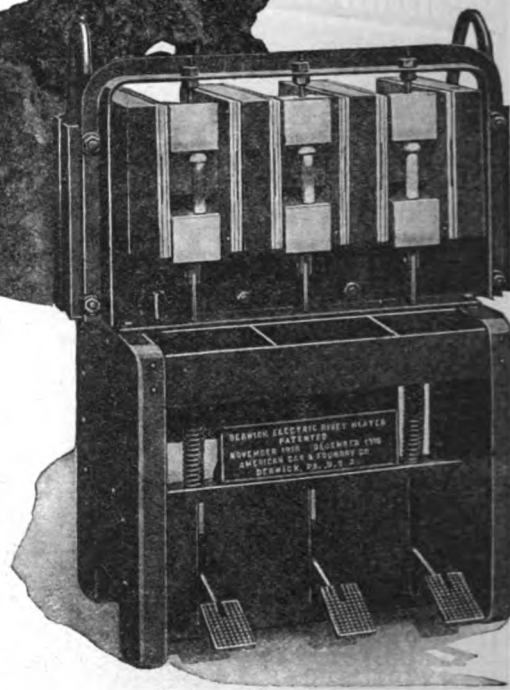
You can stop this waste and effect other economies—

at the same time improve working conditions—by installing Berwick Electric Rivet Heaters.

We've used 50 of these heaters in our own shops for six years. One hundred and fifteen other manufacturers are using them—495 heaters altogether.

They have proven economical in operation, consuming not more than 20 kilowatt-hours per hundred pounds of rivets heated. They eliminate smoke, fumes, dirt, and excessive heat radiation. They produce hot rivets in 20 to 30 seconds after starting. They are conveniently portable, simple to operate, and safe.

Nine standard types and sizes for all rivets up to $1\frac{1}{2}$ " x 10" or larger; capacities up to 600 hot rivets per hour.



Investigate Electric Heating of Rivets!

Send for catalogue. Please state rivet requirements and alternating current conditions.

American Car and Foundry Company

CHICAGO

165 Broadway, NEW YORK

ST. LOUIS

Railway coach, dining and sleeping cars; express, baggage and mail cars; electric railway cars; freight cars, including box, flat, gondola, hopper, dumping and tank types and cabooses; special purpose cars for carrying cane, live stock, etc.; industrial, mine and logging cars; car parts, including trucks, coupler pins and links, and chilled cast iron wheels; electric rivet heaters; bar iron and steel; bolts, nuts and rivets; iron-body gate valves; flanged pipe.

33



Please mention THE MARINE REVIEW when writing to Advertisers

CAMERON PUMPS

Refinement of detail is the answer for "Cameron" superiority.

Our engineers have successfully solved pumping problems of every description. Their vast experience has taught them the necessity of precise design, of discriminating choice of materials, and of expert workmanship.

They have incorporated these essential factors in every Cameron Pump—and have insisted upon utmost refinement of detail. The result is absolute satisfaction on the part of Cameron Pump users.

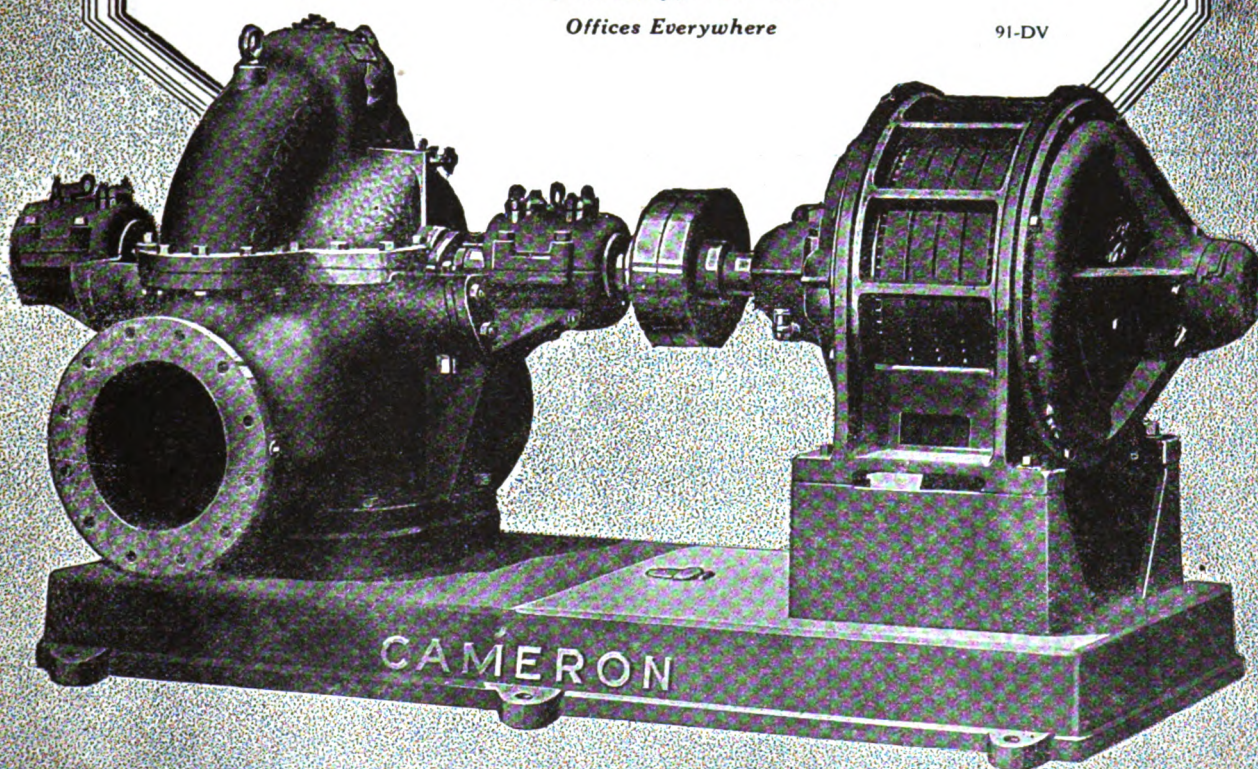
*You should have the benefit of this experience
and know this satisfaction.*

A. S. Cameron Steam Pump Works

11 Broadway, New York

Offices Everywhere

91-DV



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CRAMP

High-Grade Tin Base Babbitts

The indorsement of this company on its metals carries greater weight in the maritime industry than many a so called "iron clad" guarantee. Time and service have proven the dependable and uniformly high quality of Cramp marine babbitts.

Among Our Leading Products Are the Following:

(1) **PARSONS' WHITE BRASS No. 2**, the best known babbitt for slow speed marine engines.

Elastic limit under compression -	5000
lbs. per sq. in.	
Brinell Hardness - - - -	34
*Coefficient of friction - - -	.00748
Load - - - - -	500
lbs. per sq. in.	
Speed on journal surfaces - -	400
ft. per min.	

(2) **PARSONS' WHITE BRASS SA**, the highest grade babbitt for high speed heavily loaded engines.

Elastic limit under compression -	6000
lbs. per sq. in.	
Brinell Hardness - - - -	46
*Coefficient of friction - - -	.00801
Load - - - - -	750
lbs. per sq. in.	
Speed on journal surfaces - -	600
ft. per min.	

(3) **CRAMP'S GOVERNMENT BABBITT**. For this we use Composition "W". This is the only genuine babbitt, many others marked "Genuine" being imitations and not containing the essential components of composition "W".

Elastic limit under compression	4500 lbs. per sq. in.
Brinell Hardness	28
*Coefficient of friction	.00894
Load	300 lbs. per sq. in.
Speed on journal surfaces	400 ft. per min.

*Tests conducted under ordinary sight feed lubrication.

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SHIP & ENGINE BUILDING COMPANY**

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Like a faithful servant, Wall Rope stands by you when others fail. With ninety years of experience in rope making and without a thought to expense, Wall Rope is the best that could possibly be achieved.

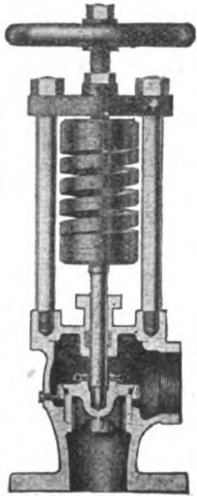
Look for the Wall Trade Mark whenever you look for Quality.

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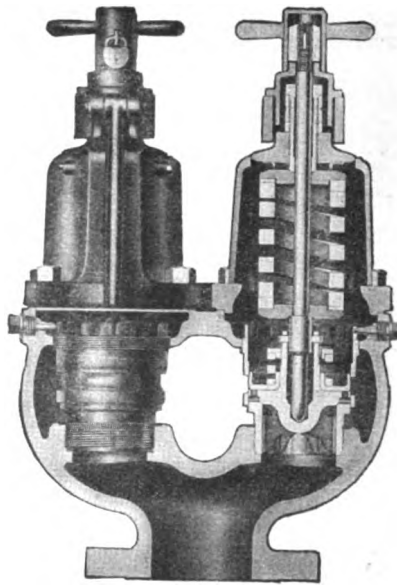


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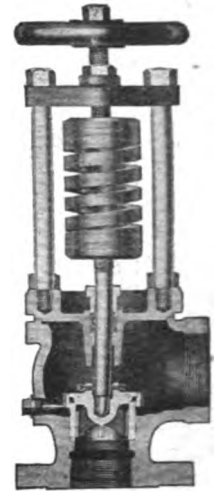
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We are manufacturers of about 20,000 articles, including valves, pipe fittings and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes, and are distributors of pipe, heating and plumbing materials.

Wasting Coal Costing \$22.00 a Ton or Saving \$3.30 a Ton

A whole ship load of coal sold in Boston recently for \$22.00 a ton.

You may not be paying as much for your coal or as proportionately high for fuel oil—perhaps you pay more.

Whatever you pay, you waste fuel when your ships operate on saturated steam and waste is inexcusable when a practical means to save it is available.

When ships operating on saturated steam are converted into the economical class by the application of Elesco Fire Tube Superheaters, a saving of upwards of 15% in fuel is realized. With coal at \$22.00 a ton, this represents a saving \$3.30 a ton, or \$3300 on a 1000 ton bunker capacity.

Fire Tube Superheaters may be installed while the ship is in port taking cargo.

More cargo space is available on ships equipped with Fire Tube Superheaters, because less bunker space is required. Less fuel in bunkers means less weight of fuel to be carried.

Our Bulletins explain the advantages of high degree superheat—advantages which have been considered worth while in over 2000 ships.



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General Offices—30 Church St., New York

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Designing Engineers and Manufacturers of ELESKO Steam Superheaters
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FIRE TUBE SUPERHEATERS



"NACO"

Electric

CAST STEEL

ANCHOR CHAIN CABLE

marks the only advancement in the development and manufacture of chain cable which is in keeping with the great progress made in ship building, as represented by the giant steel steamship of to-day compared with the wooden ships of a few years ago.

"Naco" Steel Anchor Chain is manufactured by methods which guarantee the uniformity of dimensions and shape of links, which is essential for smooth running of the chain over the wildcat.

The link and stud being one solid piece, all chance for the stud to work loose and fall out is eliminated, and the reliability of the chain greatly increased.

The material is specially heat treated electric cast steel of very much higher tensile strength than ordinary chain iron.

Specify "Naco" Anchor Chain Cable.



THE NATIONAL MALLEABLE CASTINGS Co.

CLEVELAND, OHIO

EVERY SEA GOING VESSEL NEEDS



For Fire Protection

Great losses have occurred thru failure of prompt detection and correct location of fires below deck. Of all marine fires in the past six years fully seventy per cent. started below decks.

THE RICH SYSTEM FOR DETECTING AND EXTINGUISHING MARINE FIRES not only gives immediate and accurate location of fire but also extinguishes it. It uses the steam smothering lines required by Federal Statutes and utilizes the same pipes for detecting purposes.

Adapted to use steam, water, carbon dioxide or any other fire extinguishing gas or vapor.

Full approval of Federal Authorities and recommended and endorsed by Naval Architects, Marine Underwriters, Surveyors and a long list of satisfied ship owners.

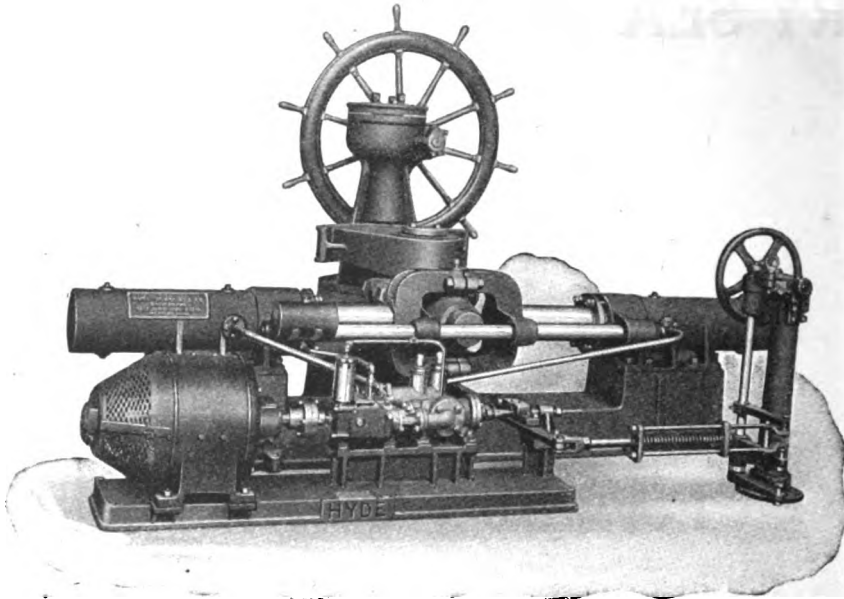
Years of actual service have proved its value.

Full particulars furnished by

WALTER KIDDE and COMPANY, INCORPORATED

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Hydro-Electric Steerer

High-Grade Marine Auxiliary Machinery
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**Windlasses — Steering Engines and
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Cargo Winches —** Steam, Hand and
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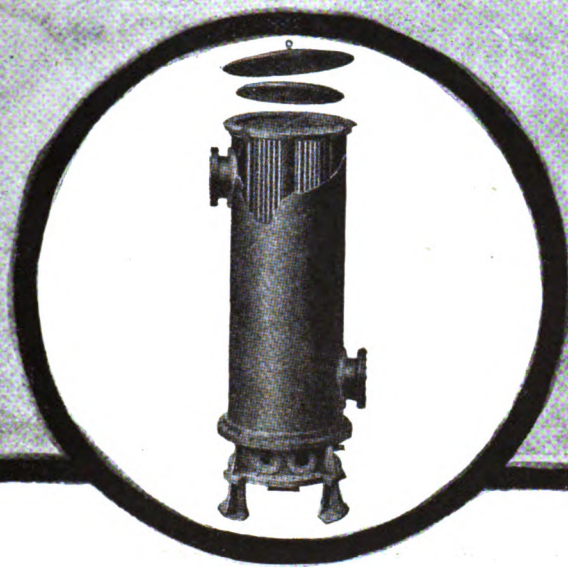
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Careful observance of the performance records of the hundreds of KERR installations has given us data of value to the ship owner, which is at your disposal.

When overhauling your present ships, or building new ones, investigate the reliability of KERR equipment.

We manufacture everything listed below. Write for our Bulletin.



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CONDENSERS • FEED WATER FILTERS • DECK WINCHES • SCOTCH BOILERS • PROPELLERS
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Let This Mark Be Your Guide

AS you trust your compass to guide you safely to port, so you may trust the mark WC to guide you to Dependable Marine Hardware.

Three generations of deep sea sailors have tested the Quality and Service of the WC Line. To their approval of its seaworthiness we owe our present standing as the World's Largest Manufacturers of Marine Hardware.

Wilcox, Crittenden & Company, Inc.
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MARINE HARDWARE

Delivered when you need it.

Dependable delivery is one of the many reasons why the House of Tiebout has become the regular port of call for so many users of Marine Hardware.

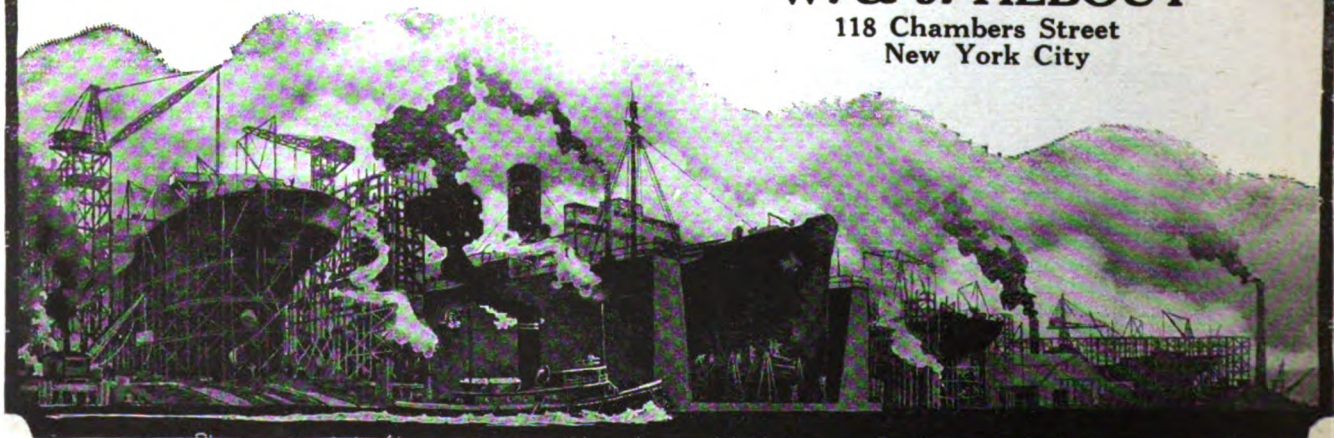
We carry in stock the most complete assortment of Marine Hardware available.

No order too small—No order too large—

Every order properly and promptly filled at prices that are right.

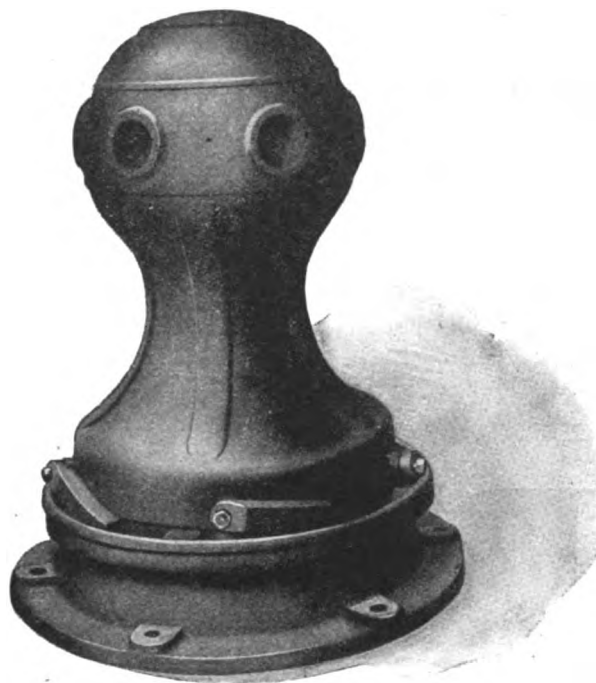
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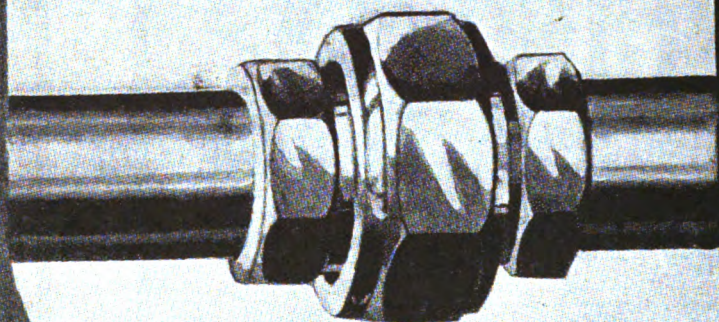
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On high or low pressure lines or those subject to temperature extremes?

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Write today for sample—put it on a line where it will have to do its best.

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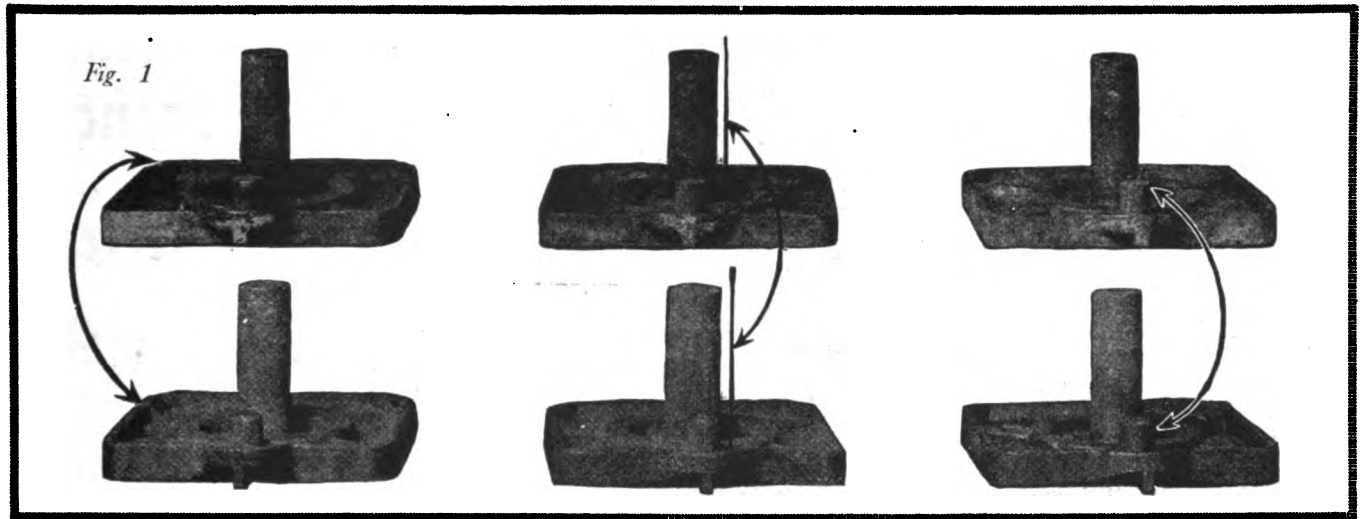
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ASH EJECTORS

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MADESCO WOOD
AND STEEL BLOCKS

MADESCO BITUMINOUS
SOLUTION & ENAMEL



Lower costs attained by elimination of unnecessary machining

NO detail of machine-shop work holds the eye of the inexperienced visitor more absorbingly than the spectacle of a machine as it gouges off deep bites of metal from a casting. Compute the cost of the machinist's time, lump in the proper overhead for the machine and floor-space, and then add the cost of waste metal and it becomes quickly apparent how expensive a form of entertainment this can be.

Every unnecessary cut is pure waste.

It represents a mistake in the selection of castings.

On this page are shown in photograph and diagram exact reproductions of castings taken from actual practice which illustrate the waste resulting from inferior castings.

The upper row in the photographic illustration above (see Fig. 1) shows a series of castings produced by machine moulding. Below is the same casting in series as made from hand-made moulds. Even in reduced reproduction the contrast between the non-uniform hand-made casting and the uniformly regular machine-made casting is easily apparent. (No effort was made to make a favorable selection of the machine-made castings.)

As the lower group of castings came to the machine shop for layout, each casting was a separate problem to the layout man. He was compelled to locate holes off center on bosses—and do many other undesirable things to make his principal cuts come uniform—or at all. Contrast this with the upper group of castings—"as like as peas in a pod"—the layout man's difficulties disappeared—repetition makes fast work easy.

Furthermore, in the case of the hand-made casting the shell of pad metal not only

bulks greater but its thickness varies greatly. So great is this variation that frequently such castings, although they appear to the eye as O. K., are dangerously near being defective because there is no margin of metal between the surface of the rough casting and the specified dimension of the finished surface. When "hollows" penetrate even $\frac{1}{8}$ " too deep, no choice then remains except to scrap the casting and charge to "Expense" the labor performed on it before the discovery.

The irregularity of the hand-made casting, when compared with the even, uniformly shallow depth of waste metal on the machine-moulded casting, makes clear at a glance the greater rapidity and uniformity possible in machining the latter.

Machine-moulding in the best machines can be accurately controlled within $\frac{1}{16}$ inch per inch of pattern draw. This degree of accuracy, backed by the fact that the machine-made mould is free from non-porous spots caused by hand-patching and slicking, insures the remarkable uniformity here pictured.

Based on this uniformity (and impossible without it),

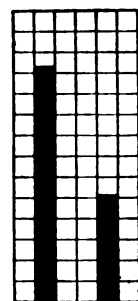


Fig. 2

Figure shows an average of comparative costs furnished by scores of machine shops before and after the adoption of machine-made castings.

wholesale economies can be effected in machine-shop practice where large scale production is the goal. First comes the sweeping economy in lay-

out time where one laying-out of a job serves as the only basis required for repetition day after day of the same cuts on castings which are themselves uniform. Second comes the saving in cutting time, due to reducing the shell of waste metal to a minimum. Compute the saving of only a single cut less across each face of a casting and then multiply it by the number of castings handled per day and you gain a partial picture of the resulting yearly economy. The third economy results from the

closely-held accuracy of the machine-made casting which virtually eliminates defective castings, and cancels the previous losses due to waste machining on defective castings—a decrease of 71% in defectives is the average result of the change to machine-made castings.

The sum of all these economies is graphically illustrated in Figure 2 which shows how the machining costs dropped in a large group of shops which adopted the machine-made casting.



BETTER CASTINGS

STEEL
MALLEABLE
GRAY IRON
BRASS
ALUMINUM

Bigger production would not justify machine-moulding if the castings were not unquestionably superior.

Osborn machine-moulding turns out more castings in the same working space, reduces or eliminates the loss in defective castings, reduces waste metal, reduces or eliminates chipping, scraping, stoning, filing, and assures satisfied customers.

In the Osborn line are hand or power-operated machines adapted to the requirements of any foundry. A letter will bring to your office an Osborn sales-engineer qualified to help you select the exact equipment for your particular needs.

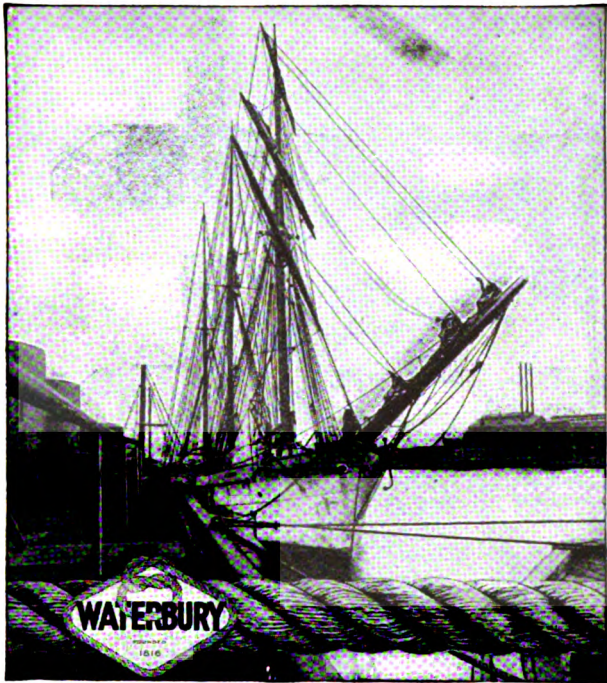
Machines for Jolting, Rolling-over, Flask-stripping, Pattern-Drawing and Squeezing.

Combination Machines for Jolting and Squeezing; Jolting, Rolling-over and Drawing Pattern; Jolting and Stripping; Jolting, Squeezing and Stripping; Rolling-over and Drawing Pattern.

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Without a Rival

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It handles work which heretofore has called for expensive, heavy, unwieldy, solid wrenches, and handles the work with less exertion.

Made in three stock sizes of 28", 36" and 48", with a special made-to-order size of 72".

The cost is less than that of a set of forged solid wrenches and the range of application is many times greater. They are the logical engine-room tool for heavy work.

Why overlook a good bet?

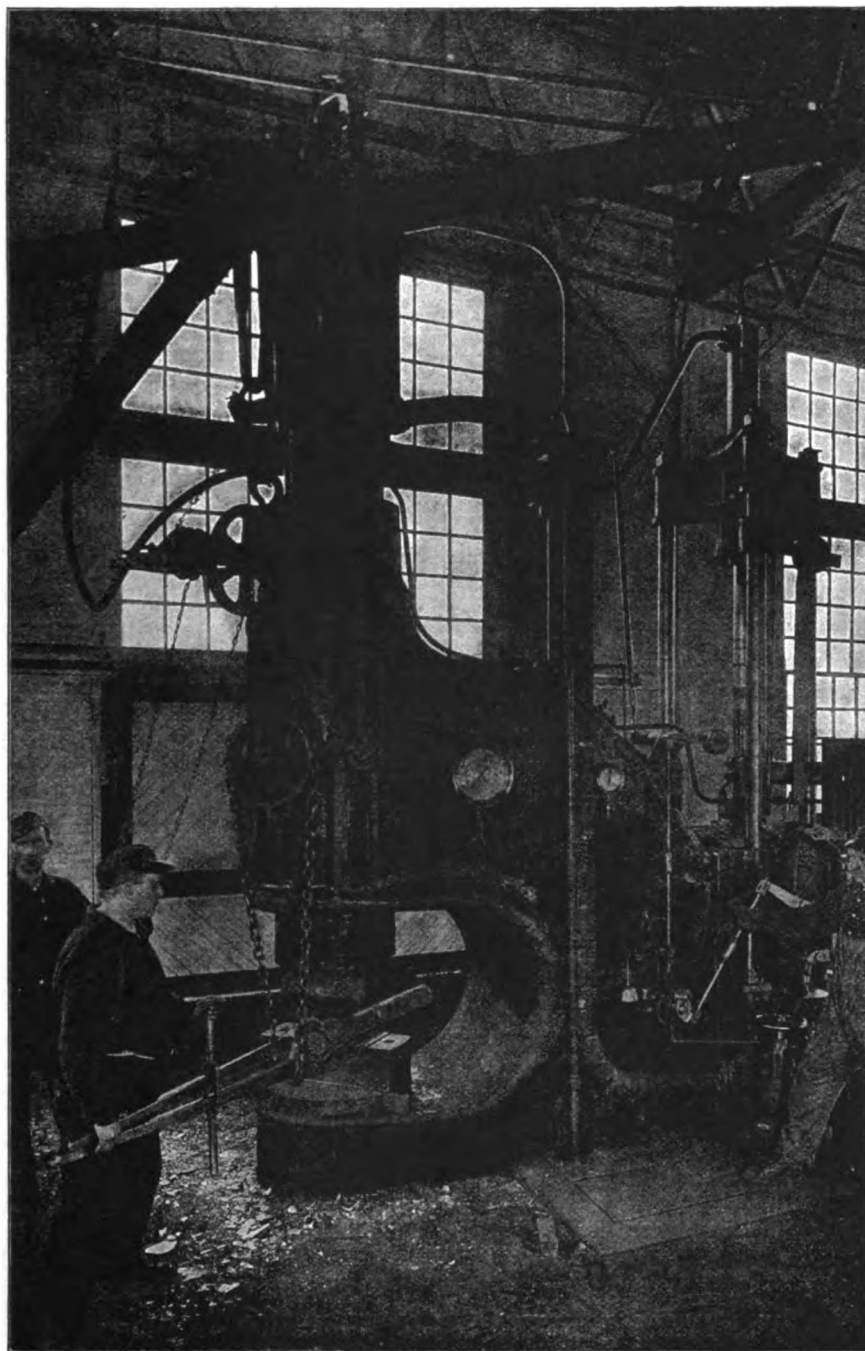
28" model opens from zero to 5 1/8"
36" model opens from zero to 6 1/4"
48" model opens from zero to 9 1/2"
72" model opens from zero to 12 1/4"

Think it over.

May be obtained from any reliable ship chandler or hardware jobber.

Coes Wrench Company
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"UNITED" FORGING PRESSES



300 TON FORGING PRESS
With Overhanging Frame

SPEED — ACCURACY

These, together with other SPECIAL features have made "UNITED PRESSES" superior to any forging machine now on the market.

Single Lever Control—Low Maintenance Cost—Small Consumption of Steam—Production of More and Better Forgings—Minimum Breakage of Parts are some of the important features.

Acknowledged to be the most modern, serviceable, and best "SAFETY FIRST" press built.

Especially adapted to Forging, Shearing, Punching, Bending, and Straightening; all of these operations included in one machine.

Single Frame Type 150 to 300 tons capacity. Four Column Type up to 12,000 tons capacity.

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*Standard Sizes in
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Winter with its ice and storms is not far distant.

Awaiting manufacture of replacements for broken prop-wheels and lost anchors often mean weeks of idleness and seriously reduces the earning power of your vessels.

Inspect your equipment now and order spare propeller wheels and anchors to be made and stocked by us awaiting your directions.

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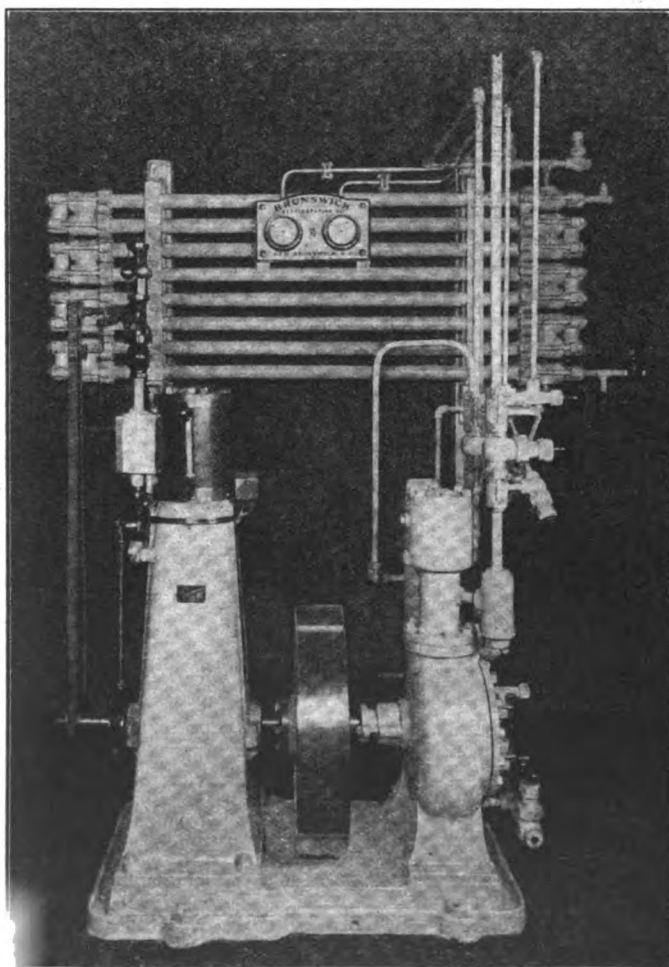
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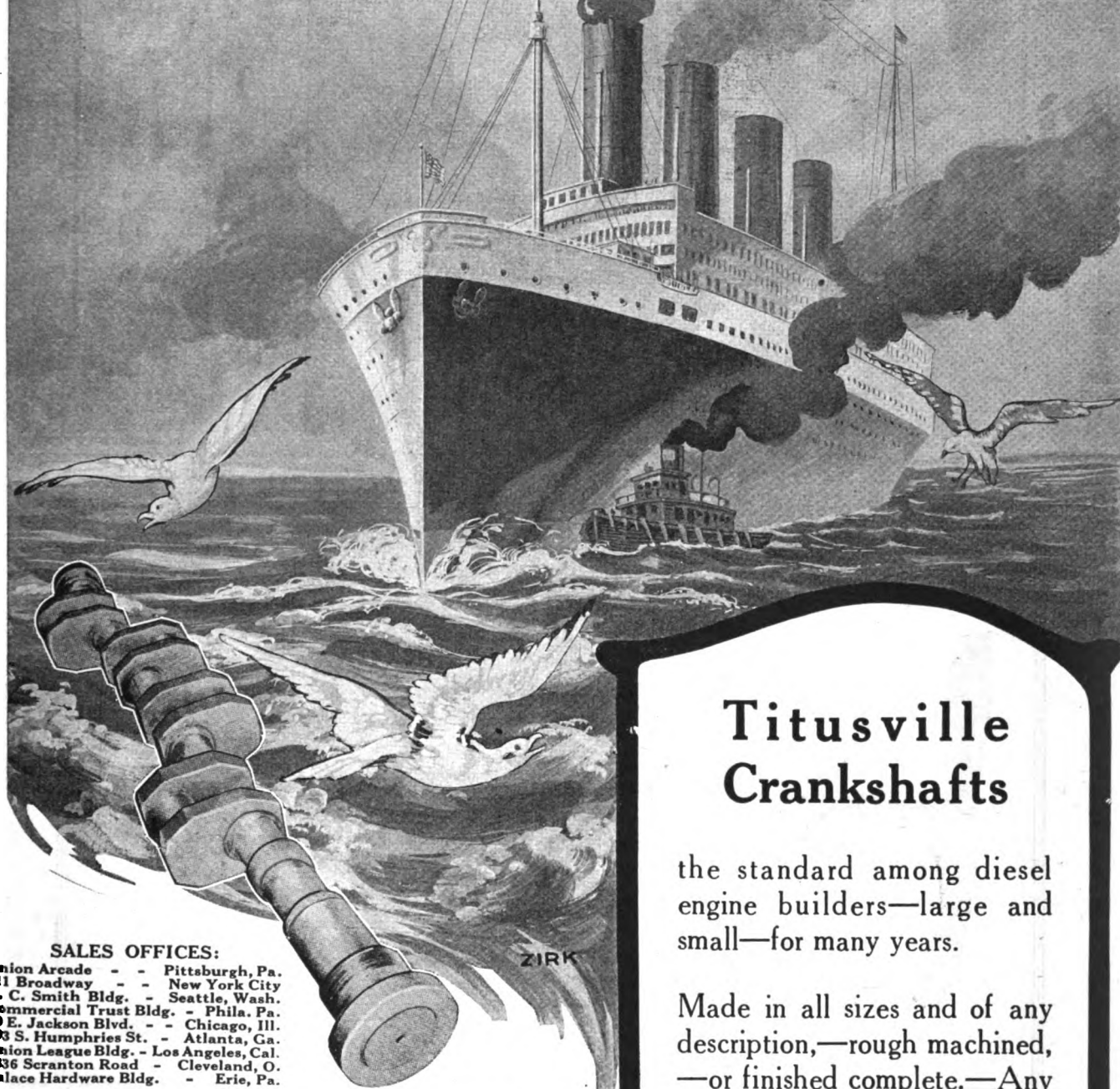
One ton Brunswick
Compressor Direct
connected to steam
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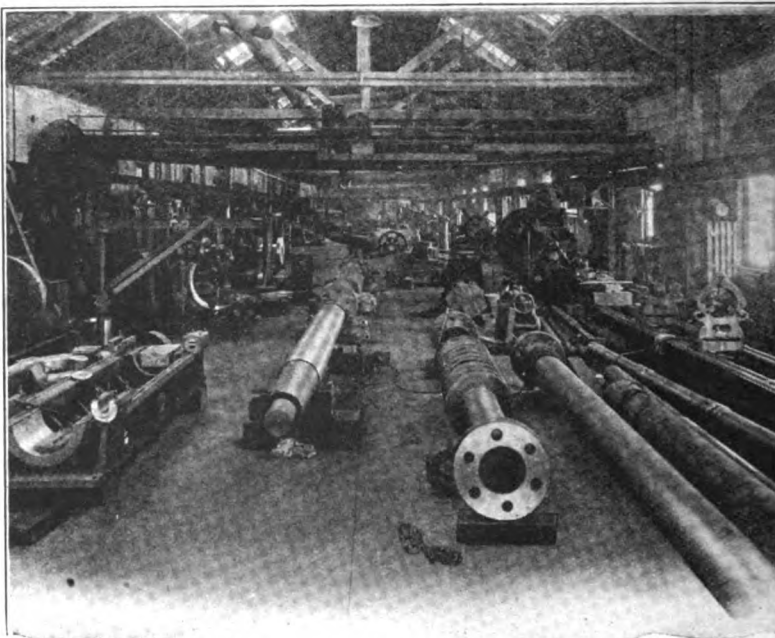
the standard among diesel engine builders—large and small—for many years.

Made in all sizes and of any description,—rough machined,—or finished complete.—Any heat treatment prescribed.

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One End of Main Machine Shop and Assembling floor, showing various classes of work in progress.

STEAM ENGINES

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BRASS AND IRON CASTINGS

STEEL CASTINGS

OF EVERY DESCRIPTION




The outer illustrations show parts of a large Stern Frame Casting. The center illustration shows the castings assembled. All work having been performed at our plant.

Difficult work is our specialty. WRITE US.

**National
Foundry Company**
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QUALITY**

**ONE PIECE
STEEL CASTING**

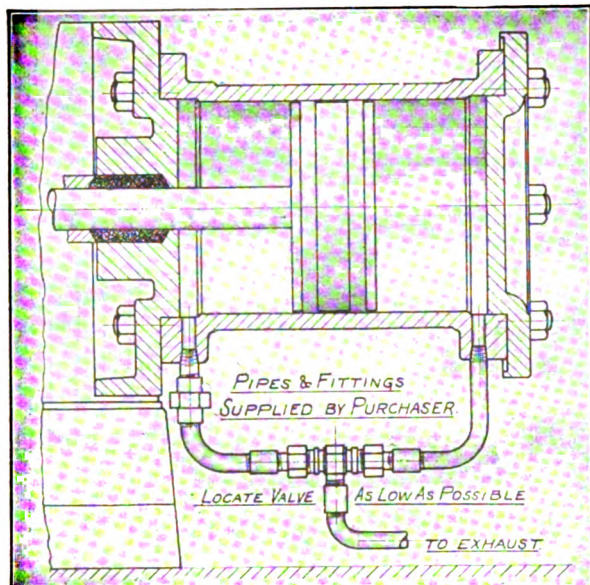
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Four Piece Stern Frames**

Iron and Open Hearth Steel Castings
up to 100,000 pounds.

We also manufacture Rolls and Rolling Mill Equipment.

WHEELING MOLD & FOUNDRY CO.
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The Dew Automatic Relief Valve

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Draining Steam Cylinders

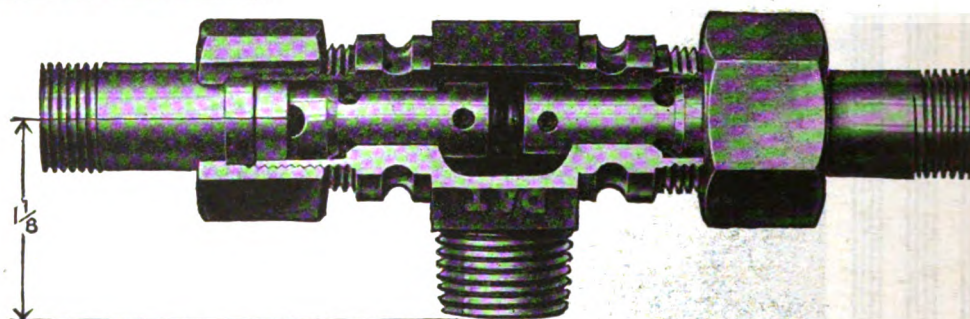
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Successfully in use on Auxiliary machinery, on various Steamship Lines and in use in many Stationary Plants.

**Manufacturers
of
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Fairbanks-Morse "C-O" Marine Oil Engines

30 H. P. TO 300 H. P.

Over 10,000 Horse-power in Phillipine Harbors



The "CGLCO" is one of Manillas' busy fleet of workboats. Her engine room is equipped with 2-100 H.P. "C-O" oil engines and a "Y" oil engine for furnishing light.

"C-O" engines give dependable power from low priced fuel oils. Simple to operate—easy to start and require little attention.

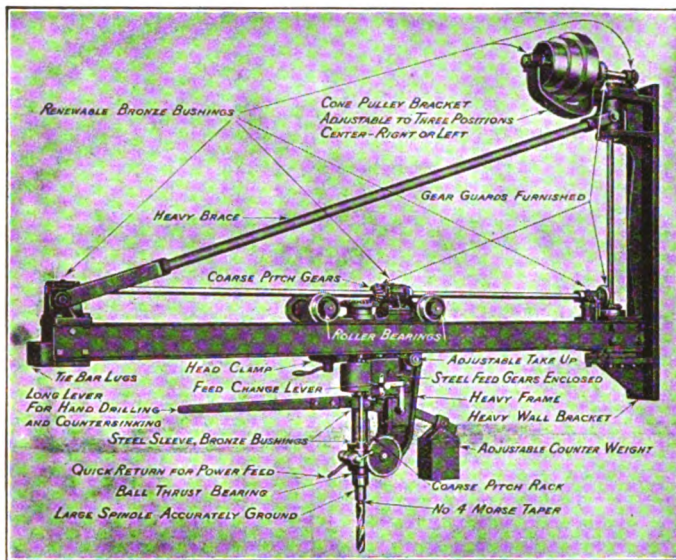
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Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

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UP AGAINST THE WALL OUT OF THE WAY



Drilling convenience at its greatest. The head can readily be moved from one end of the arm to the other, and the arm can, in turn, be swung to any angles desired.

Our catalogue gives technical data covering this money saving machine. Send for your copy.

LYND-FARQUHAR COMPANY

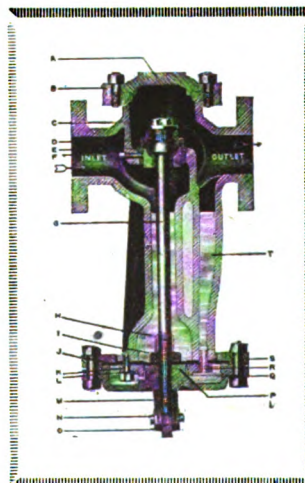
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This
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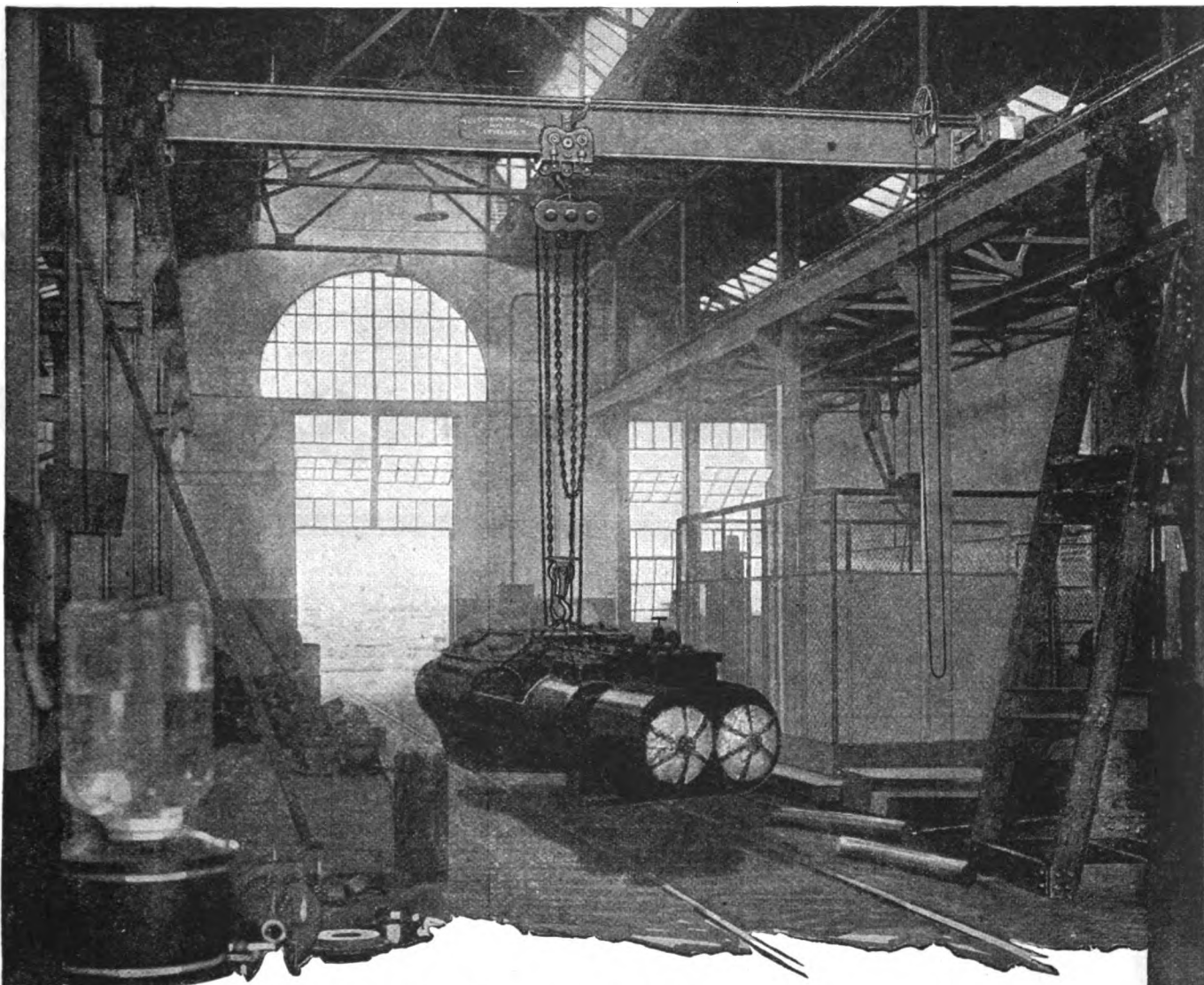
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Making it Easy with a Complete "C-M" Outfit

THIS complete hoisting and conveying system, consisting of "C-M" Single I-Beam Traveling Crane, Cyclone Hoist and C-M "Matchless" Trolley is installed in the machine shop of the Cosden Refining Co., at Tulsa, Okla. With an installation of this kind, it is easy to load and unload cars, feed heavy work to machines, pile stock, assemble heavy machinery, make installation or repairs. All this work can be done quickly, easily, with little expense and the minimum amount of labor.

C-M Traveling Cranes are made in both single and double I-Beam, overhead and underhung types, in a wide range of design, and capacities. Cyclone Hoists are made in all capacities from $\frac{1}{4}$ ton to 40 ton. C-M "Matchless" Malleable Frame Trolleys are made in capacities up to 12 tons for single trolleys, and for any capacity by combining two or more.

Catalog showing the complete line, with suggestions for installation, sent on request

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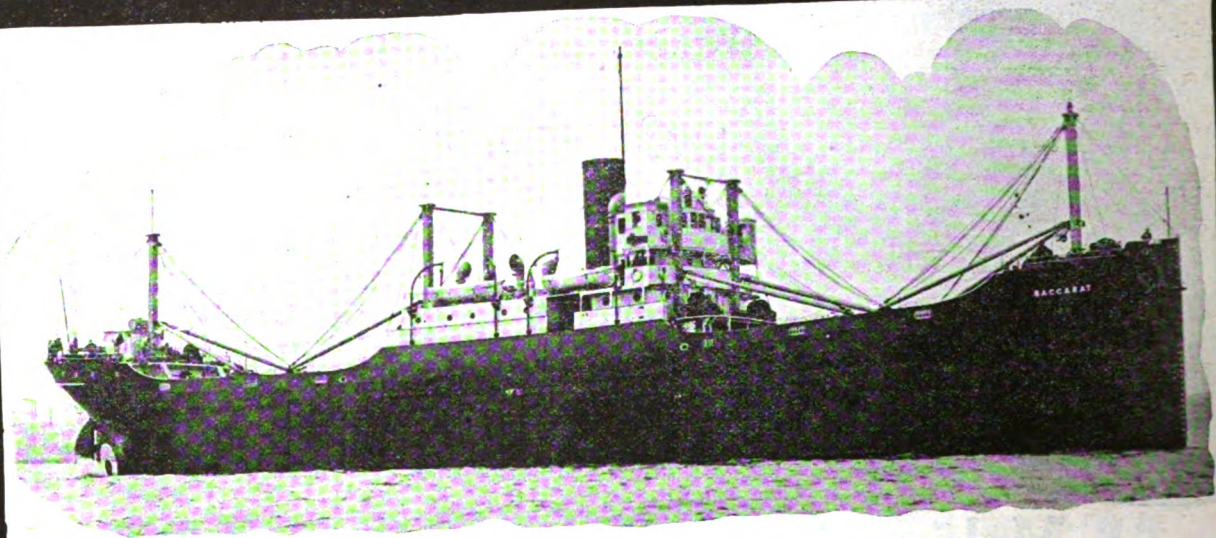
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*Ocean Going Freighter "Baccarat" length 261 ft. Carrying Capacity,
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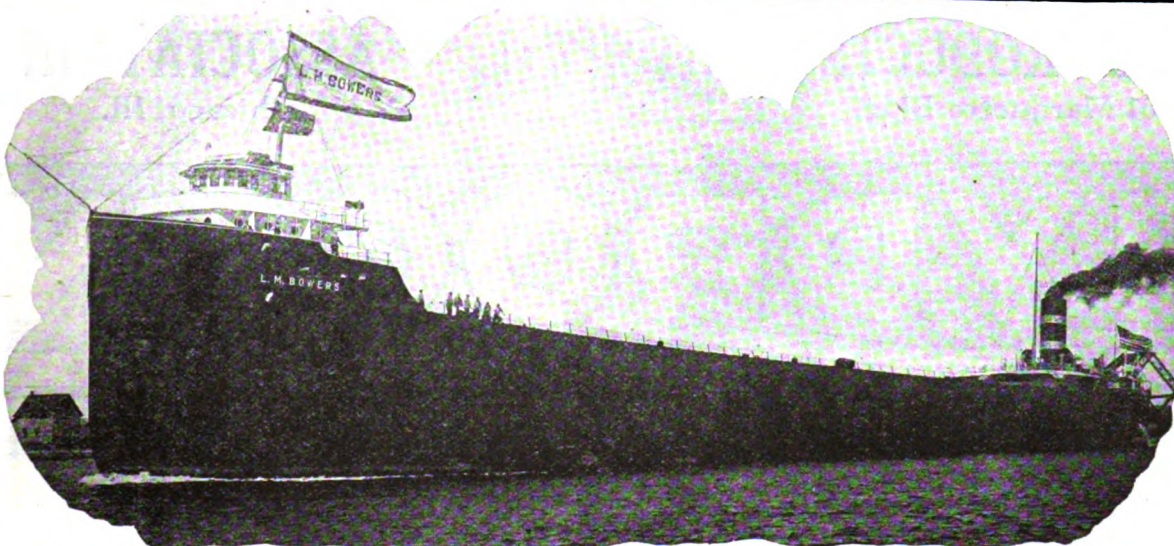
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Bulk Freighter "L. M. Bowers" Length 600 ft. Carrying Capacity 13,000 D. W. Tons

More than one half of all the tonnage carried annually on the Great Lakes is carried in ships built by this Company—

Our modern plants and efficient organization guarantee dispatch and fair costs—

Over two-thirds of all the repair work on the Great Lakes is handled promptly and economically by our expert repair organizations—

We can make anything from the largest forging to the smallest brass casting—

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All Great Lakes Terminals

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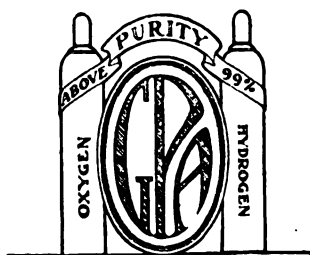
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For cutting and welding purposes, the oxygen-hydrogen flame is the swiftest, cleanest, and least expensive medium.

It causes no eye strain for the operator, will not clog the cutting torch, and can be used efficiently in the most confined spaces.

Obtainable in any quantity at 43 service stations in the United States and Canada.

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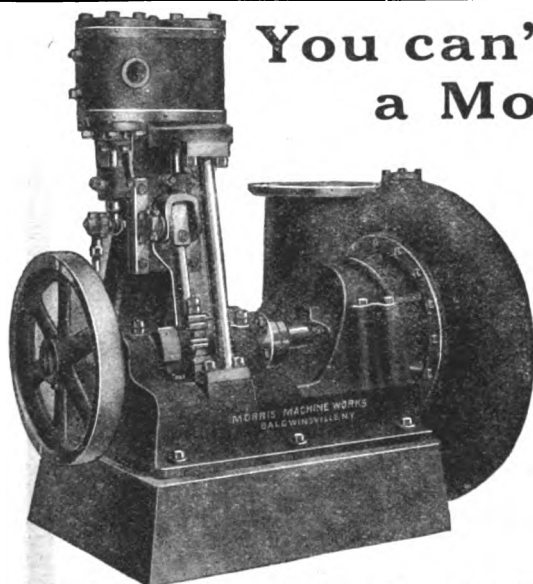


Let us refer you to the service station nearest you.

ASSOCIATION
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HYDROGEN

**You can't afford to be without
a Morris Pump on your
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When you know that 60,000 MORRIS Pumps are in service in this country and abroad, you know that they must be good.

The illustration to the left shows a directly connected Low-Lift Side-Suction Pump, particularly for circulating service.

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The Morris Pump has just one moving part. It revolves in perfect balance. It is fast replacing the reciprocating pump because it is more efficient; it never causes trouble; can always be depended upon; it costs less to install; and it costs less to operate.

May we send you full details?

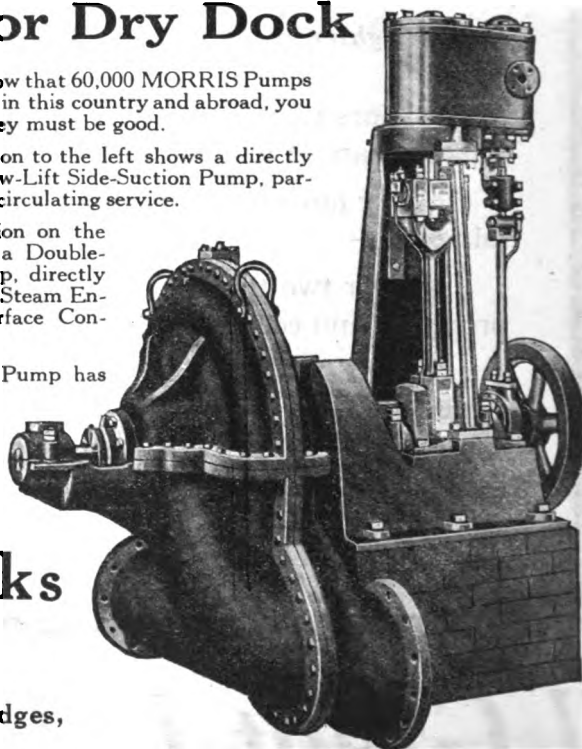
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Designers of Complete Forced Draft Installations for Marine Work
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Manufacturers of RELIANCE Standard Interchangeable
Furnace Fronts for Coal and Oil Fuel. Low Speed Radial
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Large stocks carried of Standard Fronts, Fans and Engines
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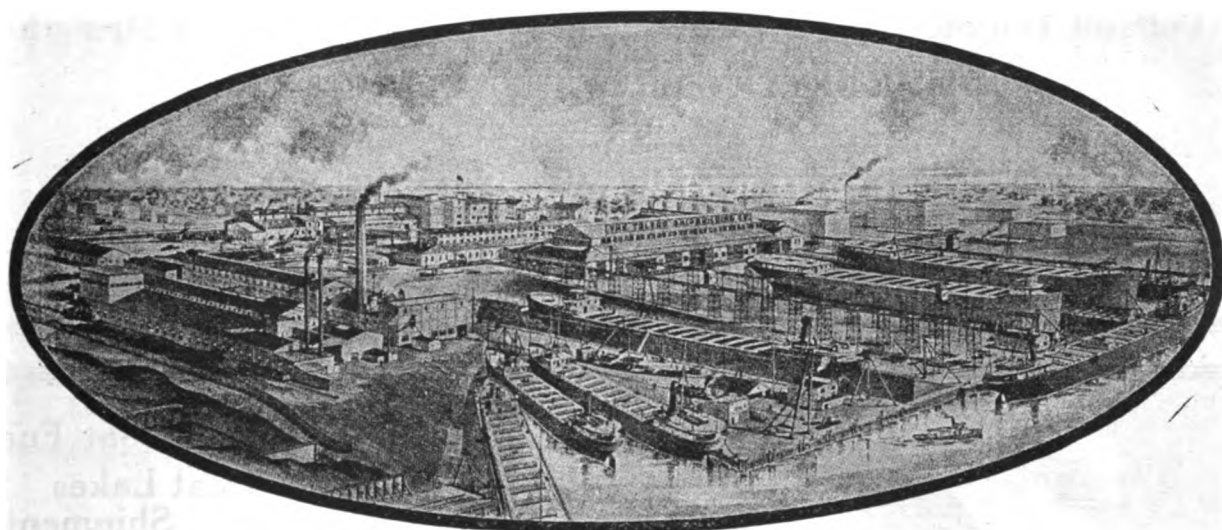
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**For Land
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Uniform Thickness

Easily Cleaned

Unexcelled for Strength

Also FOX CORRUGATED FURNACES

Manufactured by

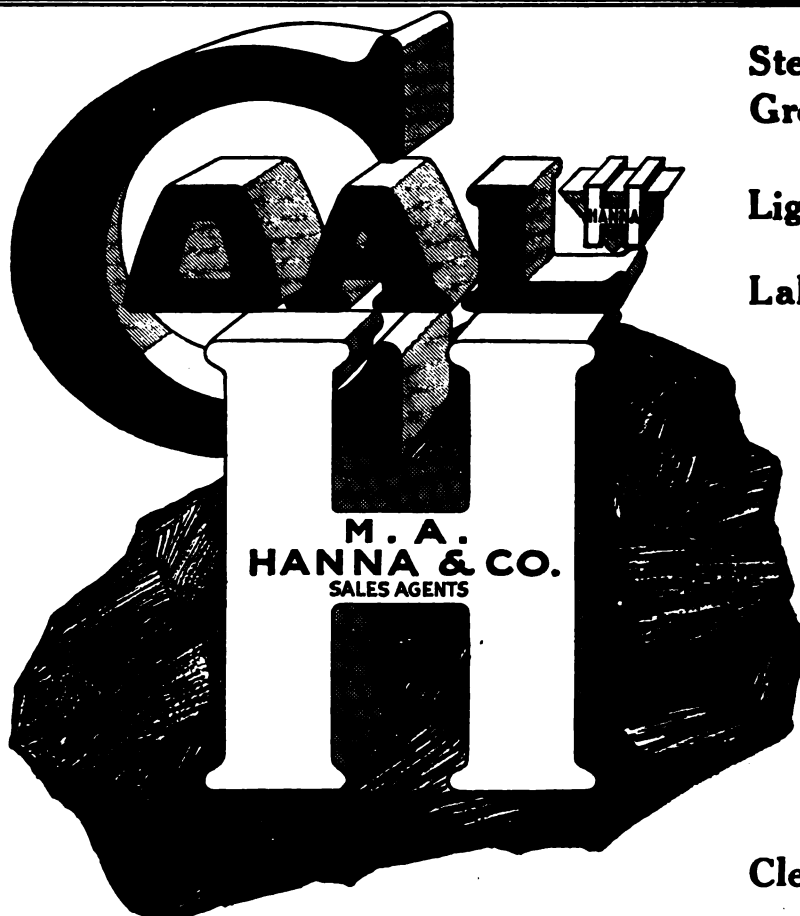
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**Steamboat Fuel
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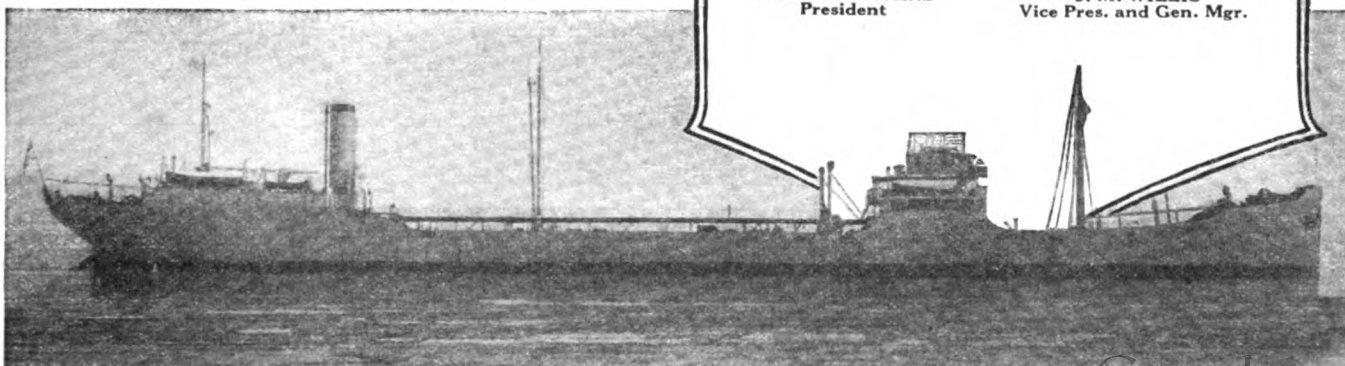
S. S. "K. I. Luckenbach" undergoing repairs in Upper Dry Dock

TWO (2) LARGE DRY DOCKS.



SEVEN SHIPBUILDING BERTHS.

10,300 ton oil Tanker "Bethelridge" built at our South Plant.



Shipbuilding— Ship Repairs—

NOW RECONDITIONING

THE S. S. "AEOLUS"

FORMER GERMAN LINER "GROSSER
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ONE OF THE LARGEST RE-
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**THE BALTIMORE DRY DOCKS
& SHIP BUILDING CO.**

BALTIMORE, MD., U. S. A.

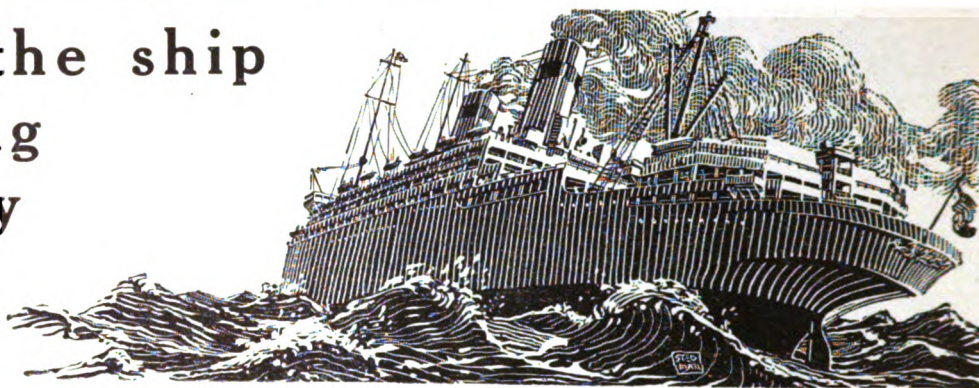
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NEW YORK OFFICE - - - 120 Broadway

HOLDEN A. EVANS
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J. M. WILLIS
Vice Pres. and Gen. Mgr.

**When the ship
is riding
a heavy
sea—**



every part is put to the severest test. It is then that failure of any of the innumerable tiny tubes in the condenser may mean disaster. If condenser tubes fail, salt water gets into the boiler feed. The boiler foams and steams badly. Salt in boiler feed water soon reduces the ship's speed and is liable to stop its operation altogether.

On land, the power plant can be shut down to replace defective condenser tubes—although this is costly.

But on a high sea, there can be no shutting down of the ship's plant.

It is for just such conditions that Wheeler Crescent Brand Seamless Drawn Tubes are made. They are tubes of the highest quality; tough, long-lived, resistive to corrosion. They are tubes you can depend upon.

No matter what you use tubes for,—whether for evaporators, heaters, reboilers, for coils, or for any other purpose, you need the same dependable high quality tubes. Why not use the best?

Wheeler Crescent Brand seamless drawn tubes are made of brass, copper, or special non-ferrous mixtures; tinned inside or outside; any size or gauge.

*Let our Research Department assist you to solve your tube problems.
Our specialty is making tubes for unusual conditions.*

Wheeler Condenser & Engineering Co.

CARTERET, NEW JERSEY

Manufacturers of condensers, circulating pumps, vacuum pumps, evaporators, distillers, brass and copper tubes and pipes.

110

“Entirely satisfactory in every respect”

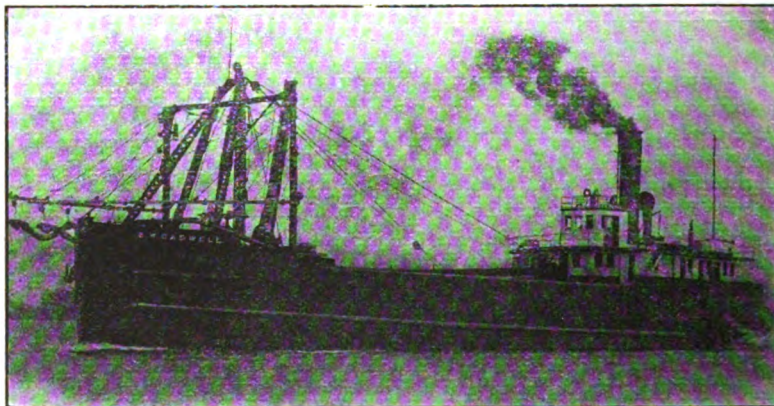
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BUILDING, PAVING AND SEWER SUPPLIES
COAL AND COKE
FREE PRESS BUILDING
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Geyser Boiler Appliance Co.
661-663 Atwater Street
Detroit, Mich.

September 23rd, 1919

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Yours truly,
A. L. HATCH,
Fleet Engineer.



GEYSER BOILER APPLIANCE CO.

661-663 ATWATER STREET
DETROIT, MICH.



Baltimore-Oceanic Says:

"Our Shore Staff find the 'Lake Girardeau' to be a very handy steamship and economical from an operating standpoint. Her skipper states that she behaves as prettily in a sea-way as any ship of her tonnage he has ever seen."

The "Lake Girardeau" was built in the Saginaw Shipyards in 1919 and has since then been in the service of the Baltimore Oceanic Steamship Company plying between Baltimore and Mediterranean ports. She was built with the care and attention to detail which characterizes all Saginaw-built ships and causes their owners to become enthusiastic about their performance.

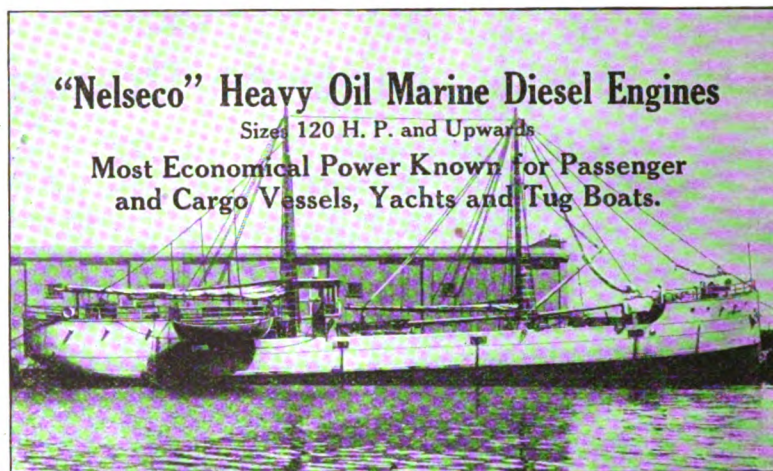
You can be sure that a ship built in the Saginaw yards will be thoroughly well made to the last rivet in the last plate.

We are at present able to take orders for steel ships up to 4500 tons for ocean service. Any size for lake service.

KE-27

Saginaw
Shipbuilding Co
of Saginaw, Michigan

"Nelseco"
Diesels are
installed in
a steadily
increasing
number of com-
mercial vessels
on the
Atlantic and
Pacific Coasts.



"Nelseco" Heavy Oil Marine Diesel Engines

Sizes 120 H. P. and Upwards

Most Economical Power Known for Passenger
and Cargo Vessels, Yachts and Tug Boats.

Reliability,
service, low
upkeep, and
ready operation
by average
engineers are the
result of the
simple design
and rugged
construction
of "Nelseco
Diesels"

*American built—
to Lloyd's Rules*

CARGO VESSEL "CERRITO"

Equipped with 240 H.P. Diesel Engine

New London Ship & Engine Company

Groton, Conn., U. S. A.

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"128 Uninterrupted Successful Years"

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Losses Paid Since Organization, Over \$217,000,000

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GEORGE L. McCURDY, Chicago
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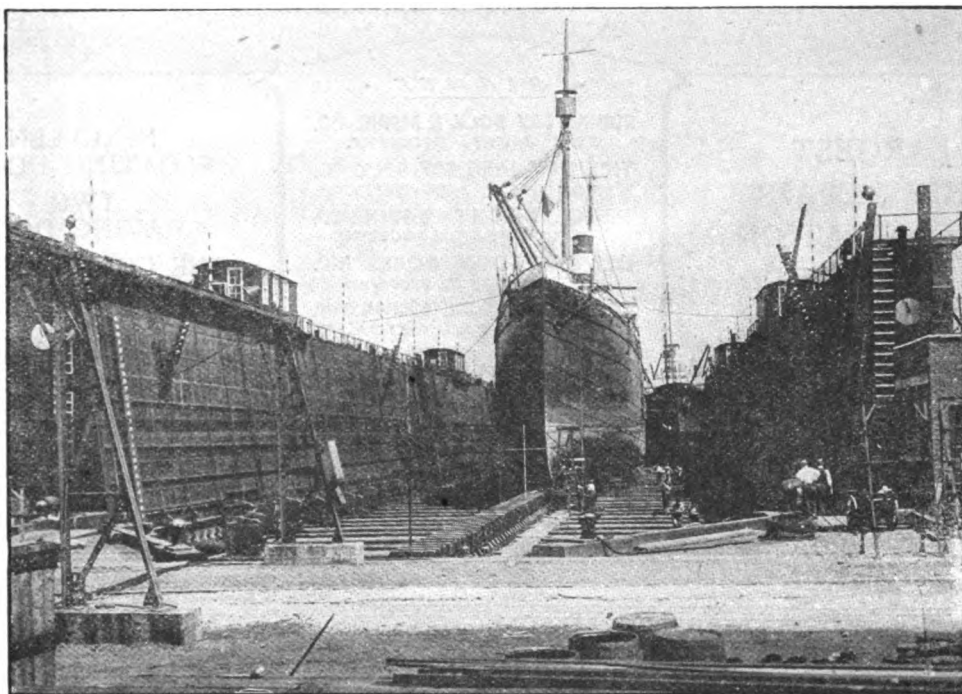
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**Builders of Parsons' Turbines, Engines, Boilers and
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SHIP REPAIRING SHIP BUILDING
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LARGEST
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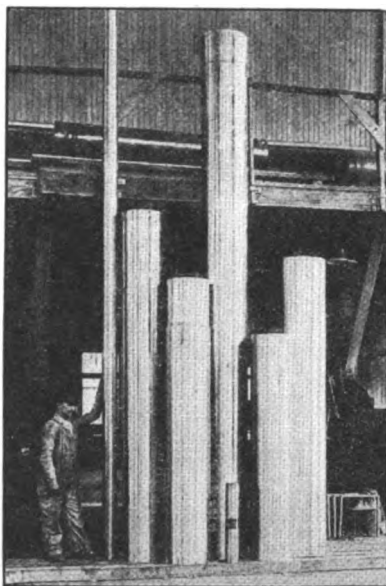
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Leading Ship Yards Use Our Fluid Compressed Sleeves
Ready For Shrinking On
No Patterns Required
Furnished On Short Notice
Machined To Size Wanted
No Splicing—No Jointing
Lengths Up To 20 Feet
Diameters 3" To 30"

Below is a Partial List of Customers who have used—
and are using—our Sleeves.

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American Shipbuilding Co., Cleveland, Ohio.
Toledo Shipbuilding Co., Toledo, Ohio.
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ALABAMA DRY DOCK & SHIPBUILDING CO.

PLANT AND GENERAL OFFICES

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CODE WORD "DRY DOCK"

THE ONLY PLANT ON THE GULF OF MEXICO EQUIPPED TO MAKE COMPLETE REPAIRS IN ALL LINES TO STEEL AND WOOD VESSELS.

NOW OPERATING SEVEN DRY DOCKS, MAXIMUM CAPACITY 10,000 TONS

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ALL
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HEAVY FORGINGS

New 10,000 Ton Dry Dock Now in Operation

THE COLLINGWOOD SHIPBUILDING CO.

LIMITED

COLLINGWOOD, ONTARIO and KINGSTON, ONTARIO
CANADA

STEEL SHIPS, ENGINES, BOILERS,
CASTINGS and FORGINGS

PLANT FITTED WITH MODERN APPLIANCES FOR QUICK WORK



S. S. "CANADIAN WARRIOR"

DRY DOCKS
and
SHOPS

EQUIPPED TO
OPERATE

DAY or NIGHT
on
REPAIRS

Please mention THE MARINE REVIEW when writing to Advertisers

A Master Feat of the Welders Art

The Biggest Boiler Tube Sheet Repair Job Ever Undertaken

In 60 days' time, we repaired 26 tube sheets by electric welding on the S. S. Von Steuben. After steaming 60,000 miles all bridges were found to be intact.

1st Method

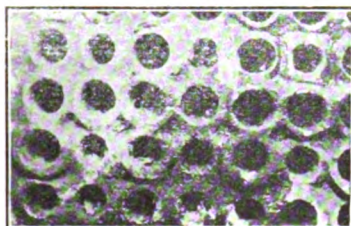


Fig. 1
Original Plate.

2nd Method

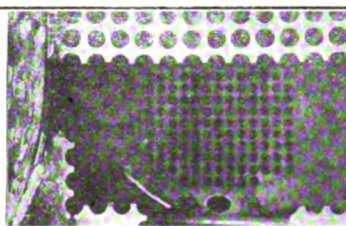


Fig. 4
Second method of cutting. Note short flange.

3rd Method

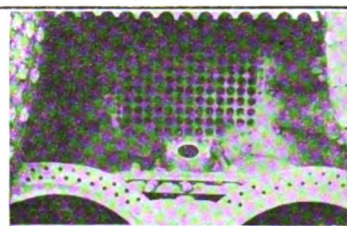


Fig. 7
Third method of cutting out plate, completely flanged.

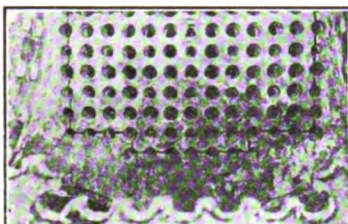


Fig. 2
Combustion chamber plate cut before removal.

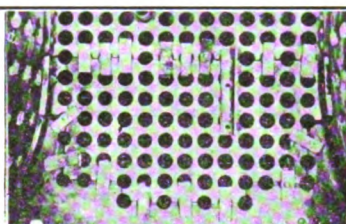


Fig. 5
New section of sheet ready for welding and riveting.

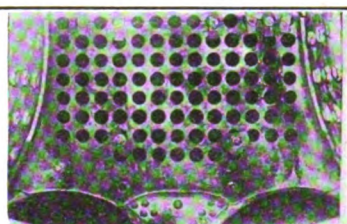


Fig. 8
Sheet bolted in place for welding 3rd method

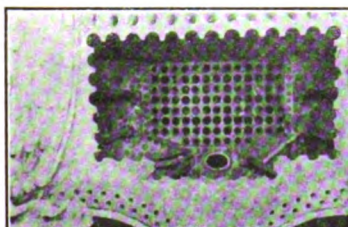


Fig. 3
Entire plate removed by 1st method.

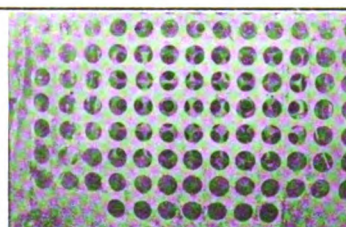


Fig. 6
Welding completed with tube holes reamed and tapped.

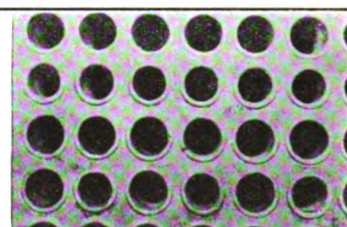


Fig. 9
Section of completed sheet.

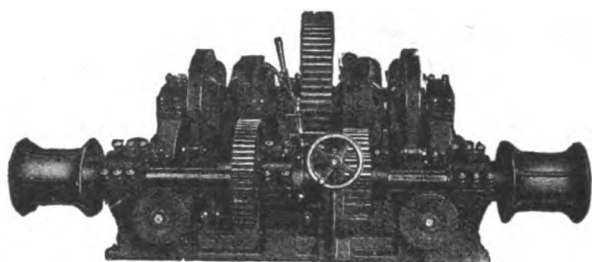
To successfully complete such a proposition as is illustrated above, it is necessary that man power and facilities be skillful, resourceful and thoroughly competent. Morse Service is performing remarkable feats almost daily and saving ship owners both time and expense. Write for literature and further details.

MORSE DRY DOCK & REPAIR CO.

Phone: Sunset 5100

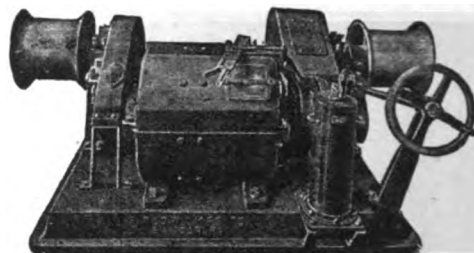
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Cableways



FLORY Deck Machinery For Every Purpose Steam or Electric

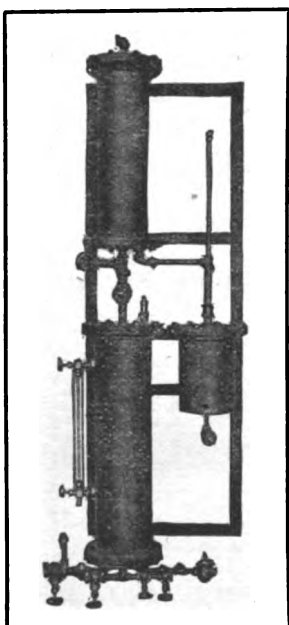
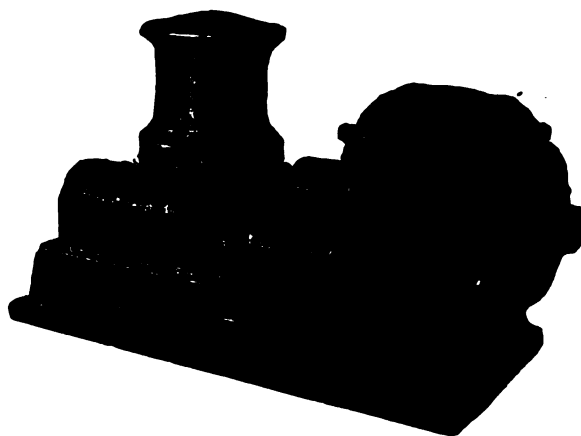


S. Flory Mfg. Co.

Bangor, Penna.

95 Liberty St.

New York City



Pure Drinking Water For Lake Steamers

To comply with the Law, all vessels operating on the Great Lakes must carry equipment for producing pure drinking Water. The most up-to-date apparatus for this service is the

G-R Evaporator Set

comprising

Reilly Evaporator Reilly Distiller G-R Aerating Filter

equipped with interconnecting piping, fittings, valve and traps, mounted on angle iron frame.

Occupies space of $2\frac{1}{2}$ ft. by $7\frac{1}{2}$ ft.

Capacity 30 gallons per hour.

Send for information

THE GRISCOM-RUSSELL CO.

2155 West Street Building, New York



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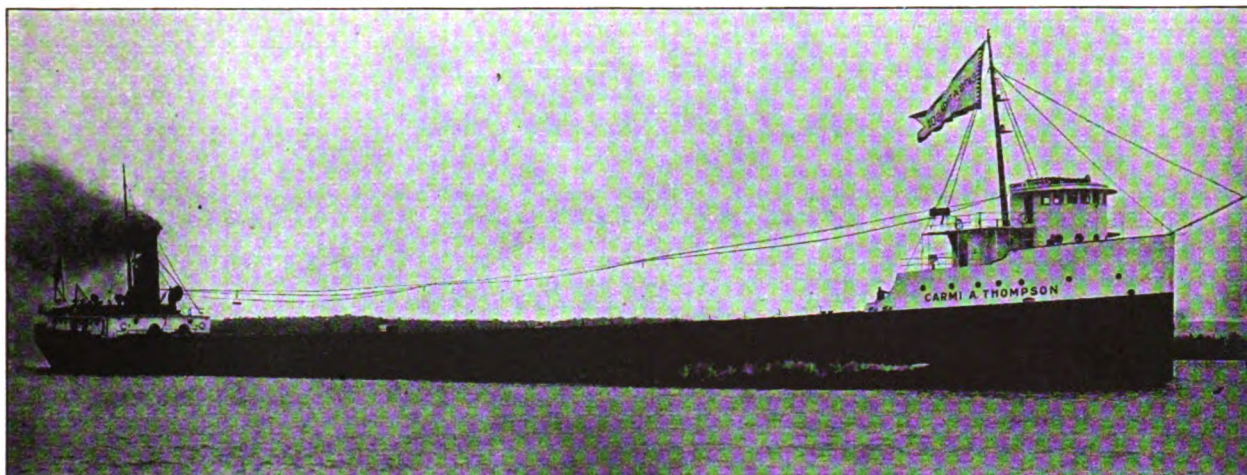
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S. S. Carmi A. Thompson built on the ISHERWOOD SYSTEM by the American Shipbuilding Co. Added length without increase of beam has increased the cargo carrying capacity without materially increasing weight of Hull.

ISHERWOOD SYSTEM

LAKE STEAMERS MAKE RECORD CARRIERS

(Per Great Lakes Weekly, dated February 20, 1920)

In 1919 the Steamer W. Grant Morden, the longest, but not the widest built freighter on the Great Lakes, carried 503,156 bushels of Wheat. This was equal to 100,631 bbls. flour, weight, 15,094 net tons. This was only 255 tons under largest iron ore cargo ever loaded on the Lakes. In 1916 this same steamer carried a cargo of 490,724 bushels.

On September 3rd last the William A. McGonagle carried 15,600 tons cargo of coal. On September 4th, 24 hours later, the D. G. Kerr took on a cargo of 15,532 $\frac{3}{4}$ net tons of coal. This exceeded for the first time the best standing figure for ore.

THESE VESSELS WERE BUILT ON THE ISHERWOOD SYSTEM

J. W. ISHERWOOD, 17 Battery Place, New York, U. S. A.

And at 4 LLOYD'S AVENUE, LONDON, E. C. 3

The following statistics show the extent to which this longitudinal system of ship construction has progressed and the number of ships ordered during each particular year:

Year	No. of Ships	Deadweight Capacity
1908.....	6	31,608 tons
1909.....	30	181,384 tons
1910.....	40	271,760 tons
1911.....	64	474,043 tons
1912.....	100	818,553 tons
1913.....	30	215,686 tons
1914.....	41	358,288 tons
1915.....	157	1,196,899 tons
1916.....	152	1,117,779 tons
1917.....	180	1,655,693 tons
1918.....	250	2,364,778 tons
1919.....	210	1,887,079 tons
Totals	1,260	10,573,550 tons

Speed

is all important in making ship repairs NOW

The busy season demands rush work—and we are on the job *early* to answer your calls. We specialize expeditious work, and you will find us as prompt as our word.

Altho our work is done *quickly*, it is done *right*, and we *guarantee* you satisfaction.

Marine Repairs of all kinds—acetylene and electric welding, boiler repairs, hull repairs, tank top work, and bilge plate work. Steel on hand to meet any job.

Telephones

Melrose 735-736 and 737

For Night and Sunday Calls

John Geistman, Mgr.
Melrose 4524

John Abernethy, Supt.
Melrose 2770

Marine Iron & Shipbuilding Co.
Duluth, Minnesota

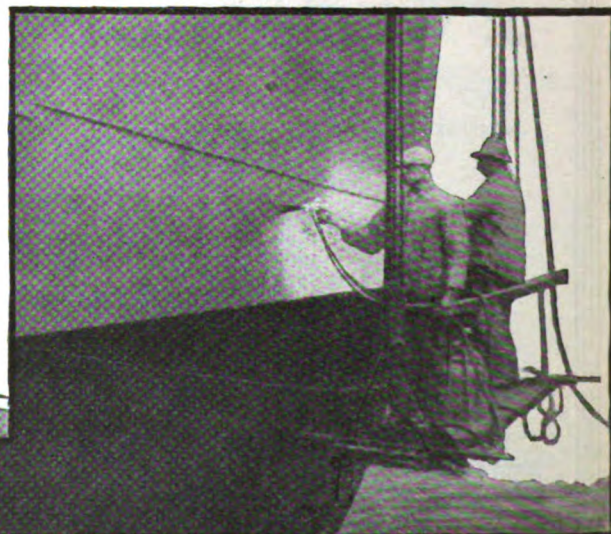
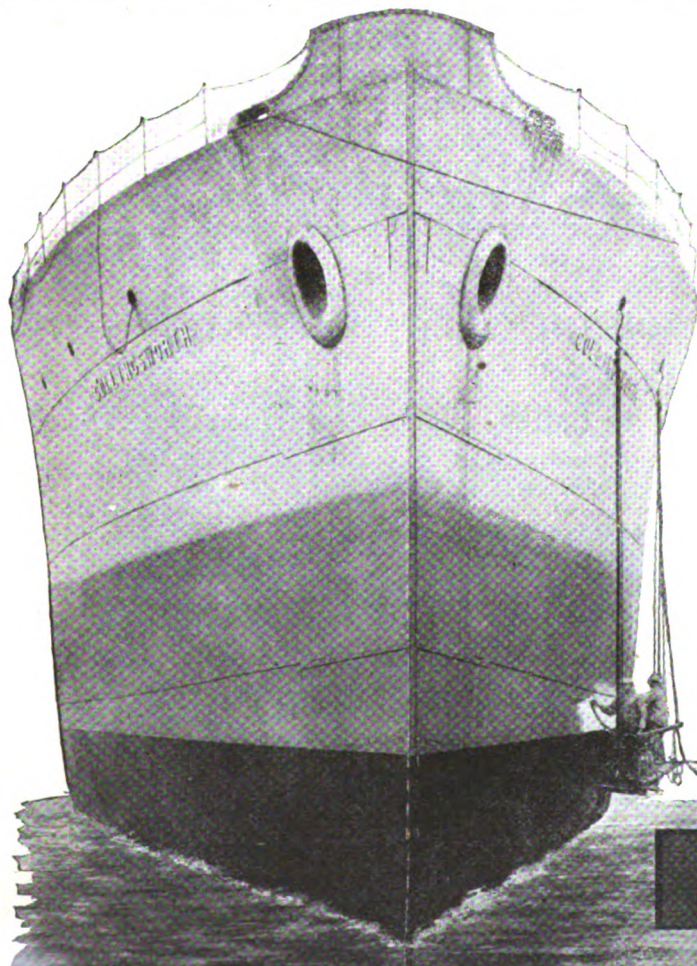
Aeron System
Painting
Surpasses Brushing

Portable Painting Equipment

will solve your painting problems. This equipment is used for spray-painting the outside and inside of new and old ships, and the yard structures. It averages 4 or 5 times faster work than hand-brushing. The surface on every kind of job is more completely covered, the coating more even and longer lasting. The same paints now used are applied, no more required. The outfit is easy to handle and move about, inexpensive to operate, and on the job every day.

*More definite information will
be gladly mailed to you.*

The De Vilbiss Mfg. Co.
3674 Detroit Ave. Toledo, Ohio



The Boat Deck

In the arrangement of the boat deck to comply effectively with official requirements of lifeboat capacity, difficult problems frequently arise, in the solution of which specialized assistance may be of value to those whose chief activities lie along more general lines.

The engineers of American Balsa Company, through years of experience in the selection and arrangement of adequate life-saving equipment, are fully conversant with the practical application of the regulations.

The wide range of lifeboats and davits manufactured by this company makes possible a service to shipowners and naval architects in the choice and arrangement of equipment, that is not influenced by unreasonable partiality to any one type.



American Balsa Company Inc.

Welin Marine Department

50 East Forty-Second Street, New York

This lifesaving equipment includes such approved types as Welin Quadrant Davits and Norton Davits, Lundin Decked and Semi-Decked Lifeboats, Standard Steel Lifeboats of improved design, Broady 2-A Lifeboats and Life Rafts and accessories.

Waterfront Warehouse and Piers Mariner's Harbor Staten Island, N. Y.

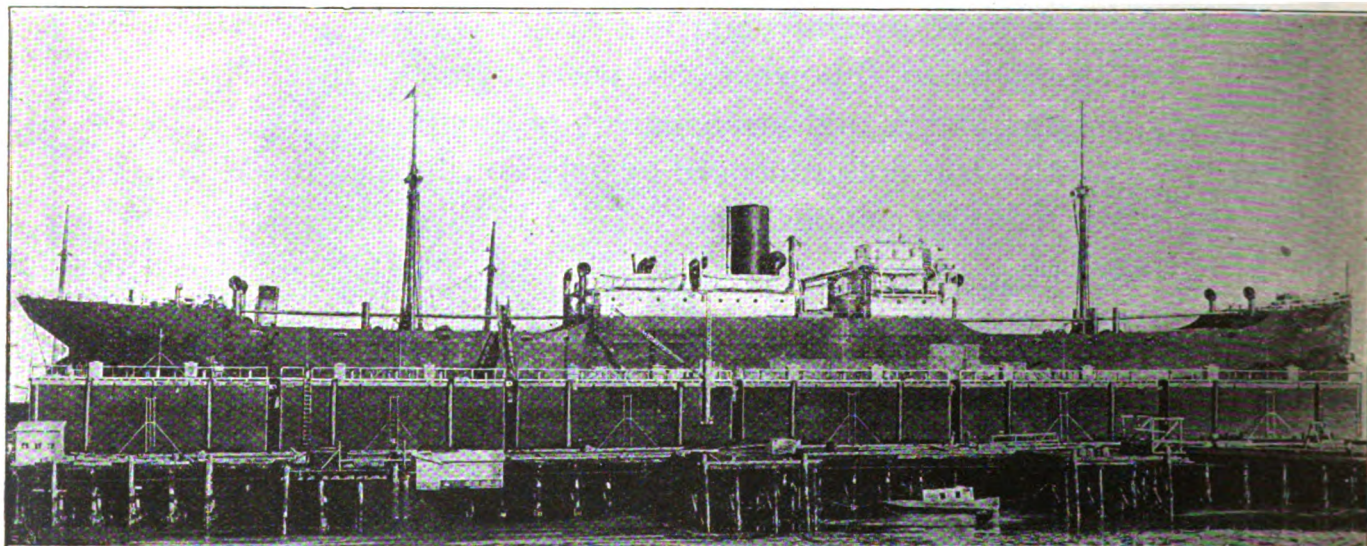
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Floating Dry Dock 8000 Tons Lifting Capacity, Charleston
Dry Dock & Machine Co., Charleston, S. C.

THE CRANDALL ENGINEERING COMPANY

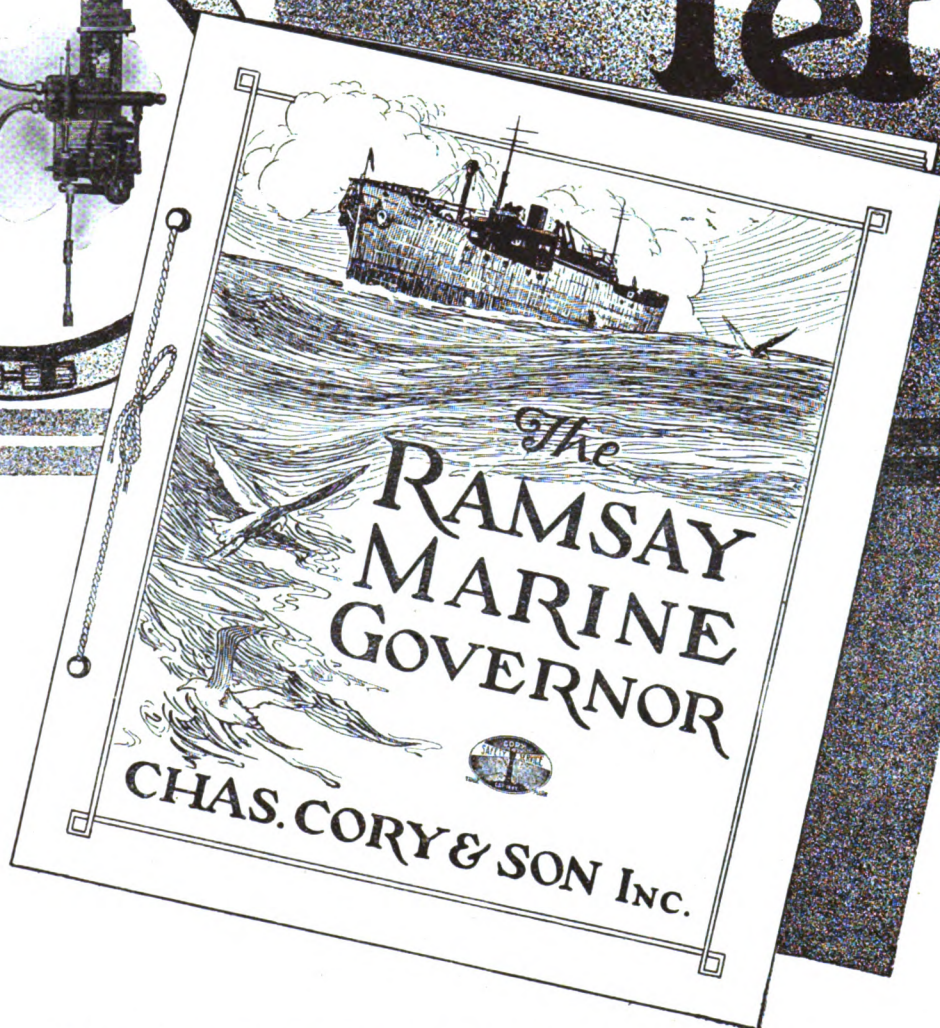
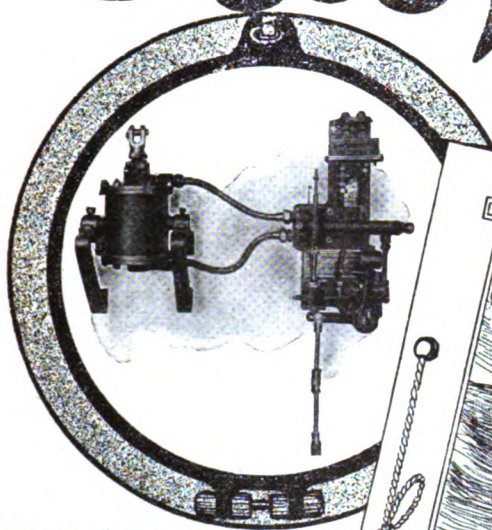
CONSULTING DRY DOCK ENGINEERS CONTRACTING

FLOATING DRY DOCKS RAILWAY DRY DOCKS

EAST BOSTON, MASS.

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Only a few left



If you have not already received a copy of the "Ramsay Catalog" write for one to-day as we have only a few left.

We shall be glad to meet you at the Second National Marine Exposition, Grand Central Palace, New York—during the week of January 24th, 1921.

Our exhibit will be in Booths 34 and 41.

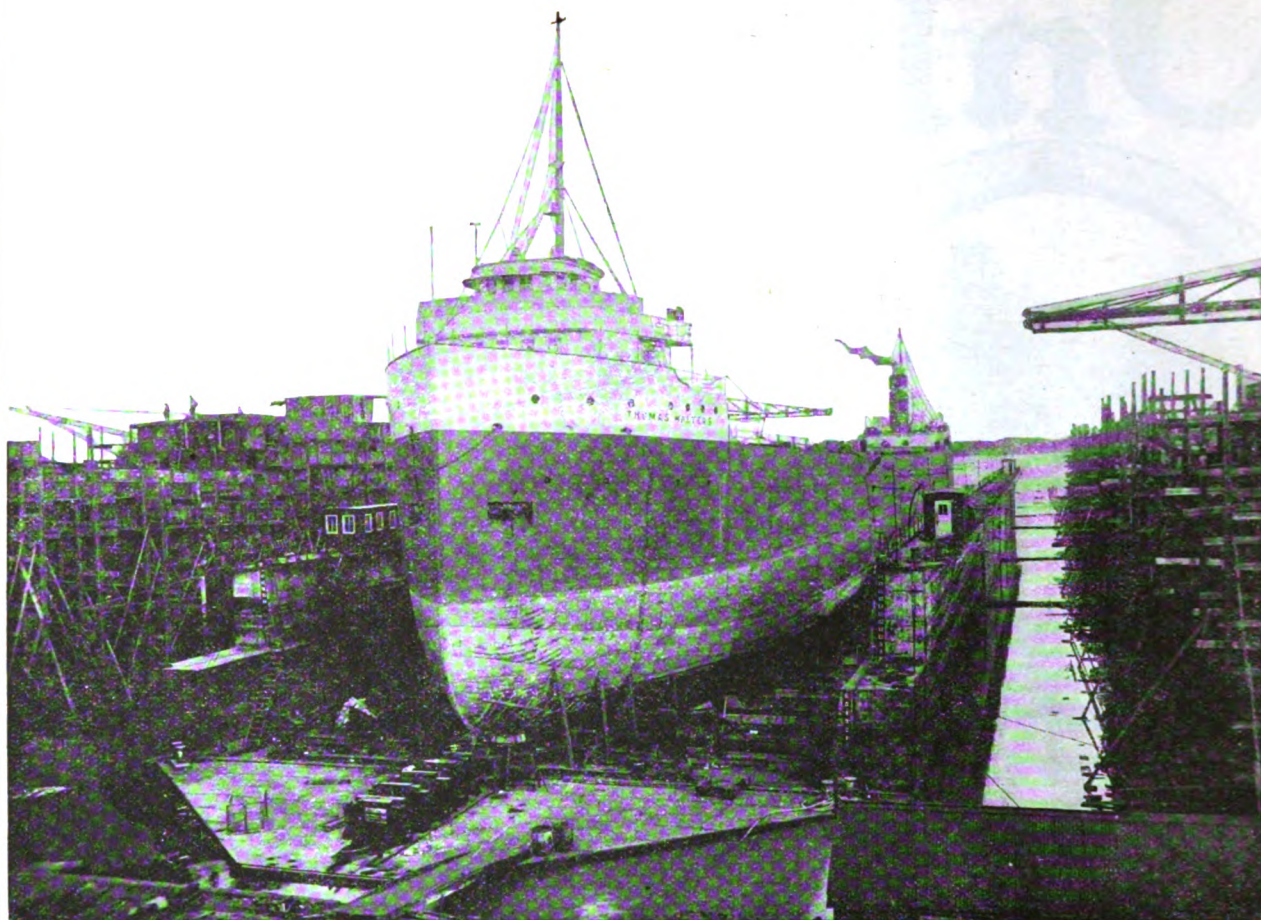
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(The largest steel vessels on the Great Lakes can be handled in this floating steel drydock at the River Rouge, Michigan, shipyard. Our graving dock at Ashtabula, Ohio, will accommodate the largest steel ships on the lakes. We have other drydocks to accommodate smaller ships and tugs.)

We extend to ship owners and operators our facilities for handling all types of marine repair work. We do so with the assurance that every repair job, large or small, will be completed in the shortest possible time.

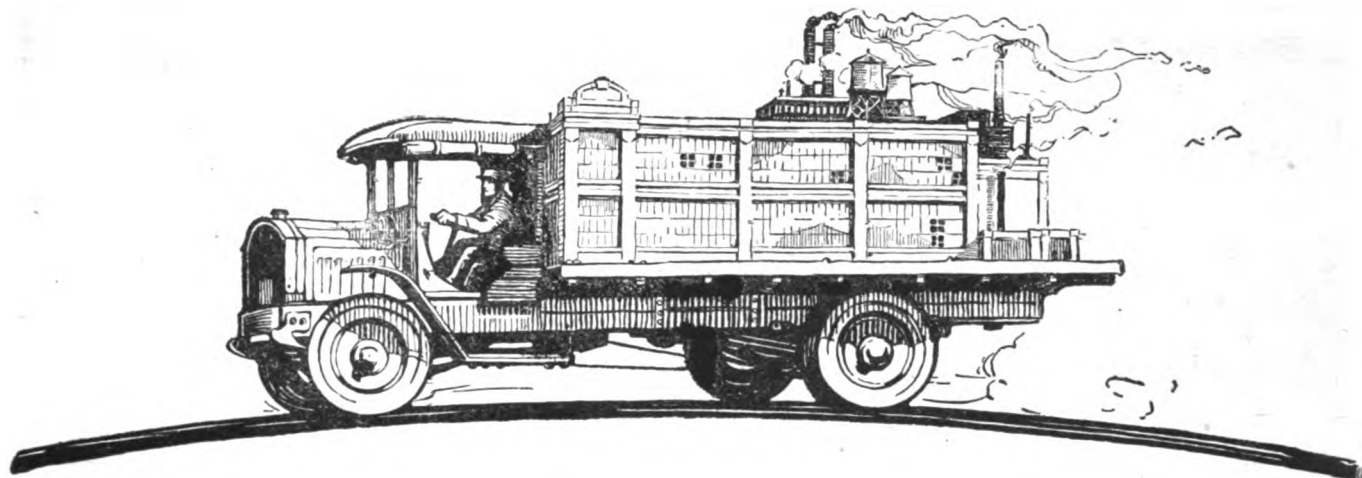
Great Lakes Engineering Works

Shipbuilders and Engineers

SHIP YARDS and DRY DOCKS

RIVER ROUGE, MICHIGAN. ASHTABULA, OHIO

ENGINE WORKS—DETROIT, MICHIGAN



A Portable Repair Shop

THAT'S what Prest-O-Lite makes of the oxy-acetylene process.

A shop ideally equipped to remake all worn out machine parts—to repair broken castings—to weld practically all metals—and to cut, most economically, all grades of steel and wrought iron.

Thus Prest-O-Lite is of vital importance to the remarkable oxy-acetylene process—the process that has saved millions of dollars in the metal working industries.

Remember—it matters little where the job is, Prest-O-Lite is available—in one cylinder or one thousand.

And our forty plants and warehouses assure practically instant service.

You will be interested in learning more about Prest-O-Lite—the Universal Gas with the Universal Service.

THE PREST-O-LITE COMPANY, INC.

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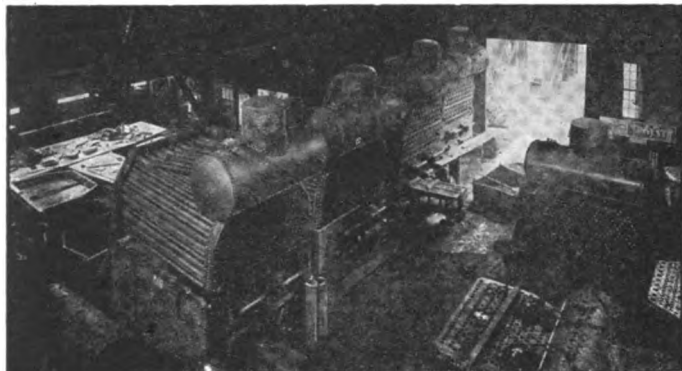
30 EAST 42ND STREET, NEW YORK

KOHL BUILDING, SAN FRANCISCO

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PW. 517



Main Floor Showing Boilers Built for U. S. Navy

STATIONARY AND MARINE WATERTUBE BOILERS

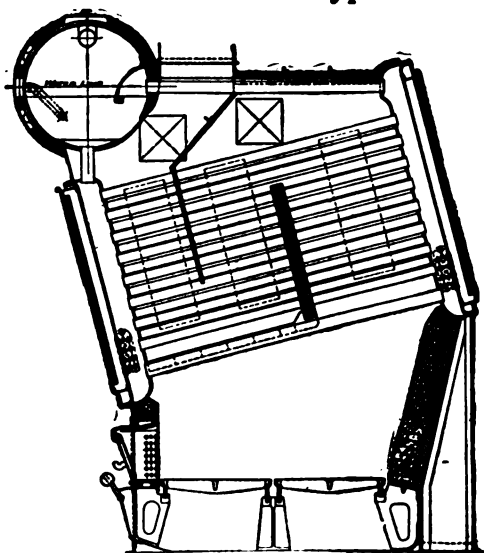
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ESTABLISHED 1845

Bridgeport, Conn.

The Wickes Marine Boiler Water Tube Type



No wrapper sheet. No riveted joints near fire. All rivets driven in header with hydraulic riveter. One caulked joint in header visible at all times.

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FORGED STEEL MARINE WATER TUBE BOILERS and SUPERHEATERS for STEAM VESSELS OF ALL CLASSES

3 Million Horse Power for Naval Vessels

3 Million Horse Power for Merchant Steamers.

EXPRESS TYPE BOILERS

(White-Forster)

MECHANICAL ATOMIZING

OIL BURNERS

3- $\frac{1}{4}$ Million Horse Power for
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650 Boilers; 5000 Burners; 1 $\frac{1}{2}$
Million Horse Power

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Scotch, Leg and Water Tube MARINE BOILERS

Unusually prompt shipment of
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Circulating, Wrecking and Dredging Pumps

High and Low Head Centrifugal Pumps

Kingsford-Stumpf Marine Una-Flow Engines

which show remarkable economy

KINGSFORD FOUNDRY AND MACHINE WORKS

Office and Works:
OSWEGO, N. Y.



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Manufacturers of
KNOBBLED CHARCOAL IRON
LAPWELD O. H. STEEL

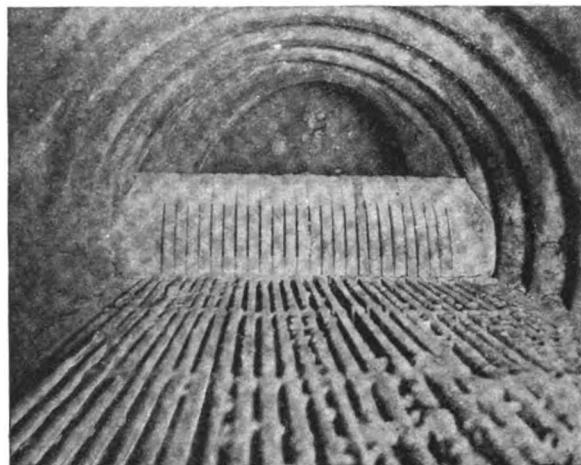
BOILER TUBES for Marine Purposes

Plain and Stay Tubes

General Sales Office
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Maximum Combustion Minimum Expense



Showing Wager Bridge Wall after being in use 60,000 miles

Booklet "L" containing list of enthusiastic users and interesting data substantiating our claims for the

WAGER FURNACE BRIDGE WALL
sent upon request.

WAGER FURNACE BRIDGE WALL CO., Inc.
Singer Building New York, N. Y.

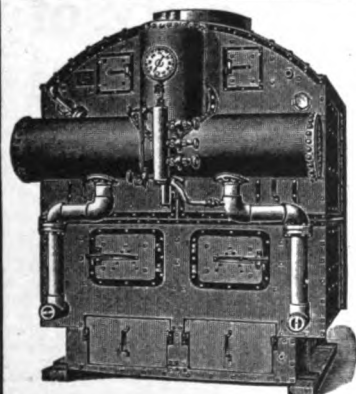
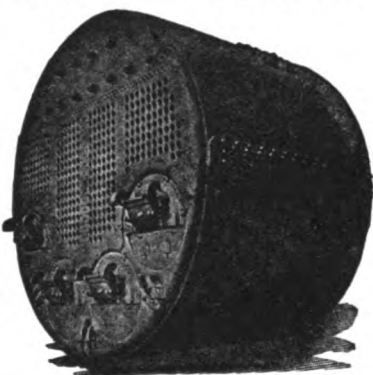
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Manufacturers
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Specialty

All Kinds of
Sheet Iron Work

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U. S. A.**



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Almy Water Tube Boiler Co.

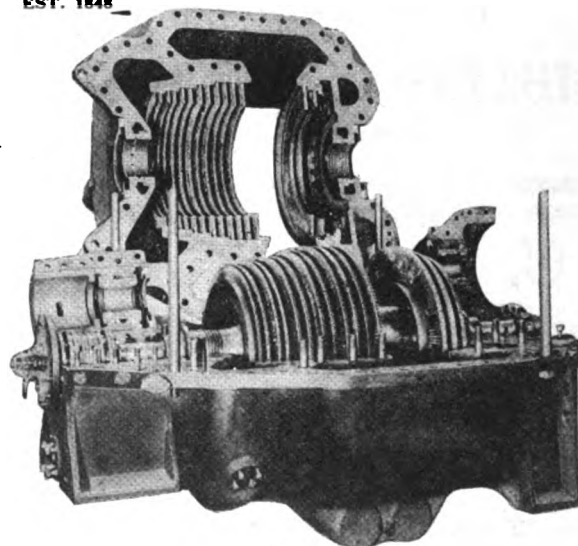
Builders of
Sectional Water
Tube Boilers
for all types of
vessels

Providence, R. I.
U. S. A.



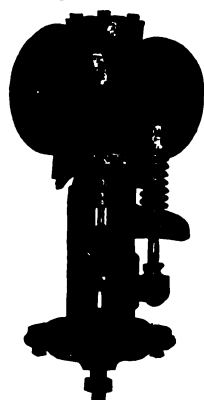
EST. 1848

MARINE TURBINES BOILERS -- ENGINES SHIPYARD DRY-DOCKS



WE REPAIR ALL TYPES OF TURBINES

VULCAN IRON WORKS, Inc.
JERSEY CITY, N. J.



The Mason No. 126 Improved
Marine Reducing Valve

THE Mason Improved Marine Reducing Valve

Can be installed close to deck or bulkhead
ACCESSIBLE SPRING

Write for circulars to

MASON REGULATOR COMPANY
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OIL or COAL

may be used as fuel with

Babcock & Wilcox Marine Boilers

by fitting

COMBINATION FRONTS

The change from one fuel to the other requires only a short time and can, if necessary, be made by the ship's force.

Orders have already been received for nearly 100 boilers.

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THE BABCOCK & WILCOX CO.

85 Liberty St., NEW YORK



American Marine Pop Safety Valves

Simple, sturdy construction.

Long satisfactory service.

Economical from every standpoint.

Specify them.

American Steam Gauge & Valve Mfg. Company
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The Oldman Boiler Works

Boilers, Tanks, Stacks, Structural Work and Castings

Boiler Repairing—Promptly Attended to Day or Night

MARINE WORK A SPECIALTY ELECTRIC WELDING

Works: 36-40 Illinois Street

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"IT STOPS THE LEAKS"

"STAY-TITE" Caulking Cement is a paste that permanently and instantly seals up cracks, seams, joints and checks of watercraft—NO HEATING. Ready for use as it comes from the package. Write us for particulars.

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U. S. Injectors are automatic

U. S. Injectors operate automatically with wide open suction at a lower steam than most injectors.

With throttled suction they are automatic at any pressure sufficient to enable injectors to get the water.

They work equally as well as a lifting injector or as a non-lifter.

Protect your boiler against feed-troubles by installing U. S. Injectors.

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Superiority of U. S. Injectors

Easier to Operate—Turning on steam starts U. S. Injectors.

Wider Range—U. S. Injectors start at lower steam and work to higher steam than any other injector.

Hot Water—They handle hotter water and feed hotter water into boiler than any other injector.

AMERICAN INJECTOR CO.

176 Fourteenth Ave.

Detroit, Mich.

The Anderson Model "D" Steam Trap

*makes your steam using apparatus more efficient
by delivering live hot steam to it*

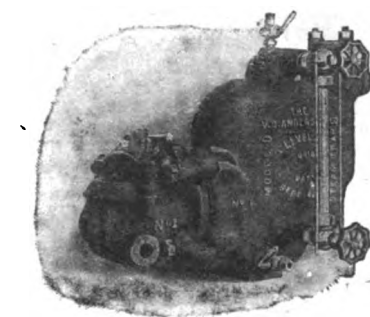
It also permits you to obtain the highest efficiency from each square foot of heating surface in your plant, by removing the condensation of your steam as fast as it accumulates.

It operates continually and automatically at pressures varying from 250 pounds, to gravity.

All parts of the Model "D" Steam Trap are accurately machined to solid gauges and can be replaced at any time, as every part is made interchangeable.

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The V. D. Anderson Company, Cleveland, Ohio



We are also manufacturers of Steam and Oil Separators; Water Columns; Air Traps; and Oil and Moisture Expellers.



FOR OVER THIRTY YEARS THE PENBERTHY INJECTOR

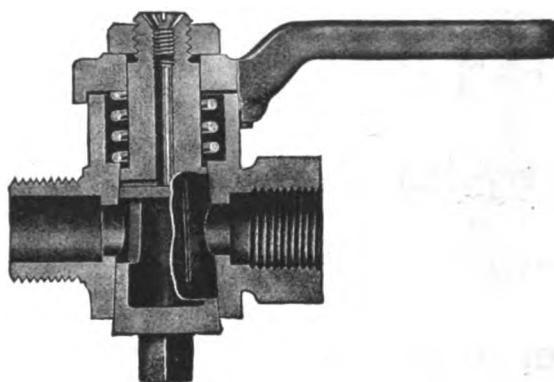
has enjoyed recognized leadership, not alone in the United States, but throughout the world.

The Penberthy never disappoints you—it is invariably dependable. That's the reason, a pretty good one, too. You should have Penberthy feed your boilers.

Catalogue on request.

PENBERTHY INJECTOR COMPANY

Established 1886
Canadian Factory Windsor, Ont. New York Depot 71 Beekman St.
DETROIT, MICH.



This illustration shows one of the "VICTORY" Lubricated Air Cocks cut in half.

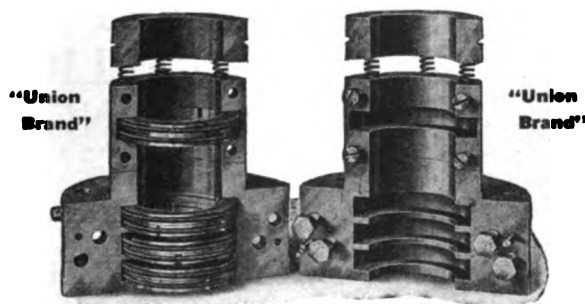
Notice the heavy walls, of uniform thickness; also the oil groove in the body—these are most important to you for they insure long life.

Light construction and lack of proper lubrication is bound to cause you serious trouble and expense.

Let us tell you more about the "VICTORY" line of products.

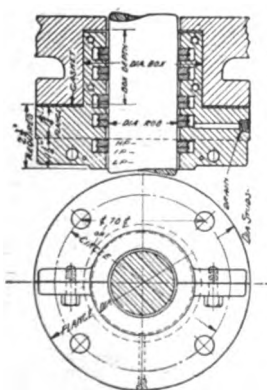
VICTORY EQUIPMENT CORPORATION
HAYDENVILLE, MASS.

PISTON ROD PACKING



All Split Case Type

PIONEER METALLIC PACKING COMPANY
67 Sullivan Street Brooklyn, N. Y.

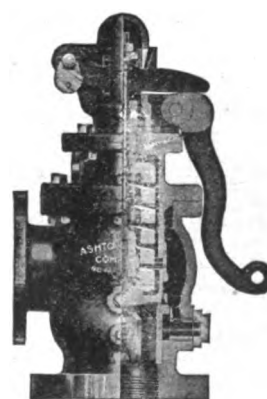


FRANCE Marine Type Metallic Packing

For All
Conditions of Service

**FRANCE PACKING
COMPANY**

TACONY—PHILADELPHIA, PA.



Ashton

Dependable High Grade
Pop Valves, Steam Gages
Whistles

Specially Adapted for
High Pressure Marine Service

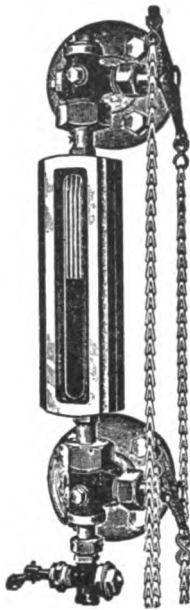
Unequalled for
Efficiency, Durability and Low
Cost of Maintenance

The Ashton Valve Co.

161 First St. Cambridge, Mass.
Branches
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JERGUSON

Engineering Specialties



Reflex Water Gages
Used on all types of boilers by all the Principal Navies of the World

"The Water Shows Black"

ADVANTAGES:

Quick and reliable observation of the water level. Safe, sure and durable at high pressures. Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gage glass fittings.

When filled with WATER the Reflex Gage always appears BLACK. When empty it instantly shows WHITE. No mistake possible. This feature alone is worth many times the cost of the Reflex.

We specialize in water gage apparatus.

Jerguson Gage & Valve Co.
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Black Frost's Kapak Red MARINE COATING

The Perfect Bituminous
Solution

HEAT 900° FAHR.

Resists

Acids-Alkali Brine, Electrolysis-Elements

*Used by Leading Shipbuilders and
Shipowners.*

Frost Paint and Oil Co.
MINNEAPOLIS CHICAGO

MARITIME HYDRAULIC OIL SERVICE

GUARDS AGAINST EXPLOSION OF BUNKER OR TANK

WM. REED-HILL N. E.

Room 702, 2 Stone Street New York City

This system of handling oils for ships, yards and docks promotes safety, economy, cleanliness and convenience. The following are some of the features accomplished not attainable otherwise.

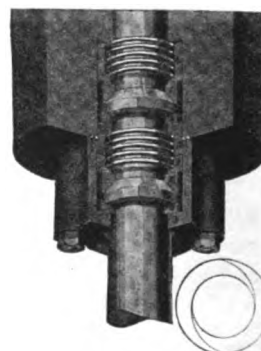
1. No air comes in contact with fluid in storage.
2. Positively no loss from evaporation.
3. Oils cannot deteriorate.
4. No gases present.
5. No gases discharged over deck when refueling.
6. Tanks cannot be exploded by fire, lightning or electric spark.
7. Oils cannot be flooded over the decks from the tanks.
8. No dirt, water, sludge or other impurities drawn over with fuel.
9. Service as rapid as desired.
10. This system is the simplest.
11. Cost of operation negligible.
12. Storage tank always full of liquid, or entirely empty.
13. Delivery of fuel is from top of tanks.
14. You always get the best fuel—not always the worst.
15. Instant and easy control.
16. Special Pneumercator recording and measuring instruments.
17. Your ships can be made steady, safer and more economical in maintenance expense.

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King Ring
in Two Parts

KING METALLIC PACKING

For
All Pressures

THE U. S. METALLIC
PACKING CO.

Philadelphia
New York Chicago

Learn all about the
SPECIAL FEATURES
of
MARTELL PACKINGS

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THE MARTELL PACKINGS CO.
ELYRIA, OHIO, U. S. A.

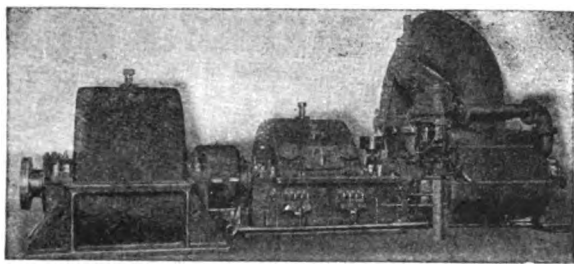
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De Laval Marine Turbines and Gears Have Demonstrated Their Superiority

A number of De Laval Geared Turbines have been in service for more than three years on vessels which have each run over 150,000 miles. Over 2,000,000 h.p. in marine gears have been produced.

The efficiency and durability of De Laval gears is indicated by their quiet operation. Excessive noise from speed-reducing gears is a sure sign that they are not accurately cut or properly supported, and means rapid wear and low efficiency. Moreover, noise from gears is highly demoralizing to engine room crews, since the engineer detects trouble in machinery by his ears more than by his eyes.

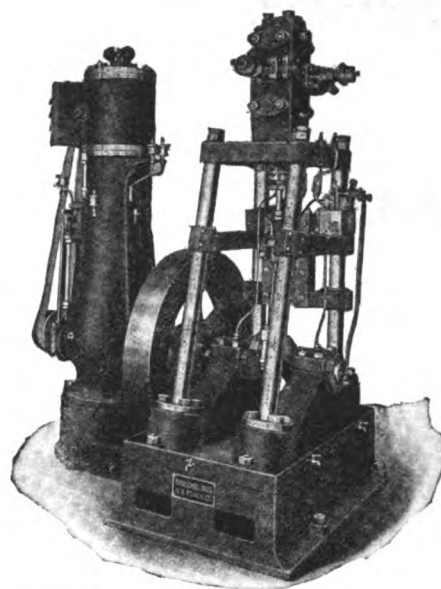
De Laval marine turbines and gears can be supplied for any capacity and propeller speed.

Ask for Catalog M-63

De Laval Steam Turbine Co.
Trenton, N. J.

127

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FOR
LITERATURE



KROESCHELL CARBONIC SAFETY REFRIGERATING EQUIPMENT

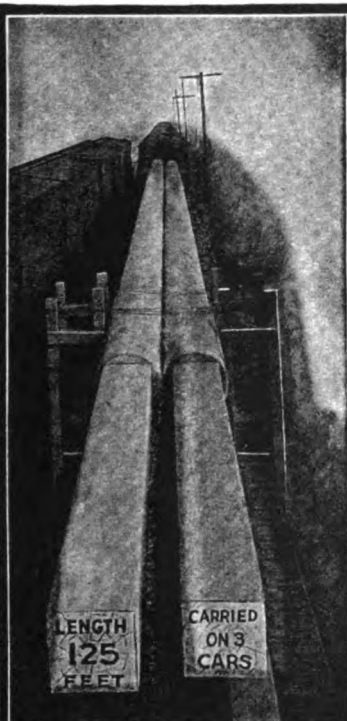
This equipment answers all possible requirements and is light, extremely Durable and safe. Used and endorsed by many Lake Vessels.

Kroeschell Bros. Ice Machine Co.

New York City

CHICAGO

Detroit, Mich.



MASTS SPARS BOOMS DREDGER SPUDS

Wherever ships go—there you will find the product of our mill.

From the best timber on the Pacific Coast—and it's the finest in the world—we make masts, spars, cargo booms, dredger spuds and all turned material for ship's use. From the smallest to the VERY LARGEST.

MACHINE MADE
according to
YOUR BLUE PRINTS
and furnished
READY FOR THE
IRONS

Send Us Your
Specifications

WESTERN SPAR COMPANY

Spalding Bldg. PORTLAND, OREGON

Eastern Representative

A. C. DUTTON LUMBER CORPORATION

Springfield, Mass. Poughkeepsie, N. Y.
5724 Grand Central Terminal, New York, N. Y.

TRANSIT PUMPS

Fifty years of Pump building has enabled us to offer this "CHESTER" type, duplex piston, Cargo Oil Pump. On account of its large fluid passages and valve area, this pump is able to handle heavy oils easily—a feature not found in many pumps.

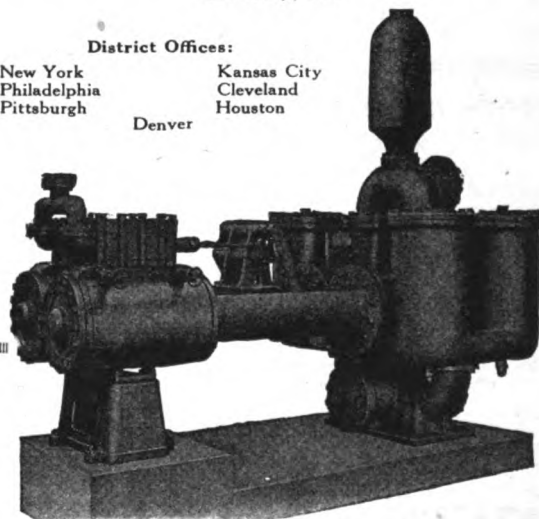
National Transit Pump & Machine Co.
Oil City, Pa.

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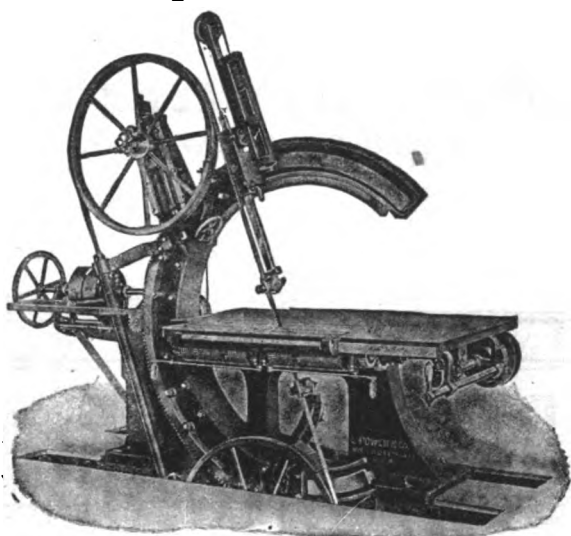
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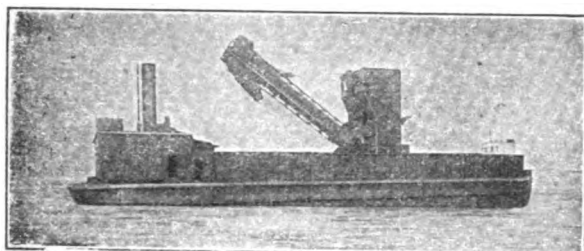
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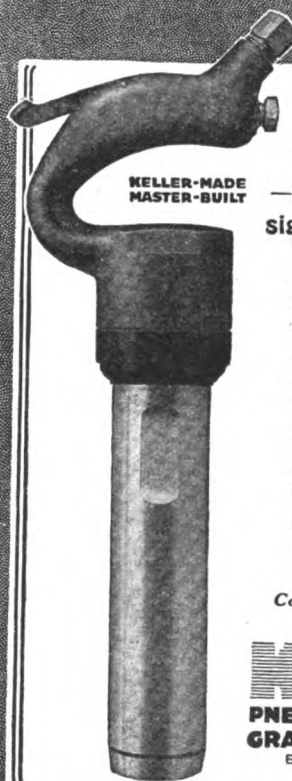
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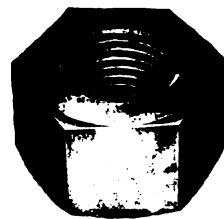
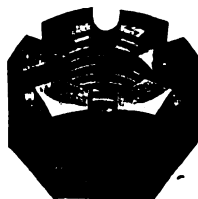
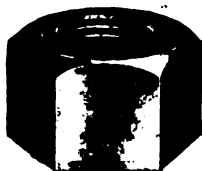
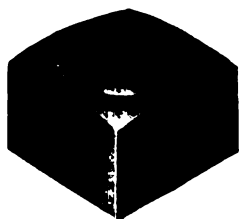
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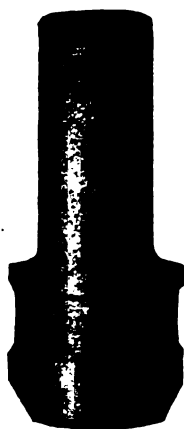
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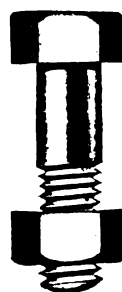
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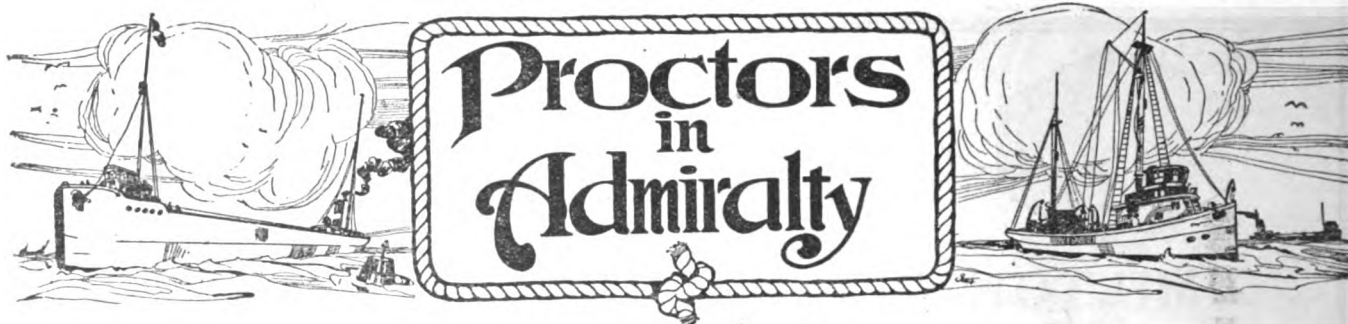
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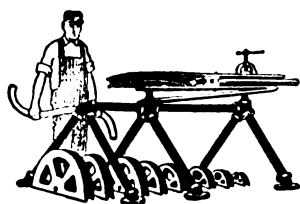
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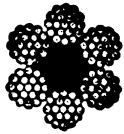
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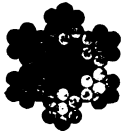
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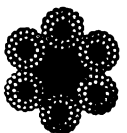
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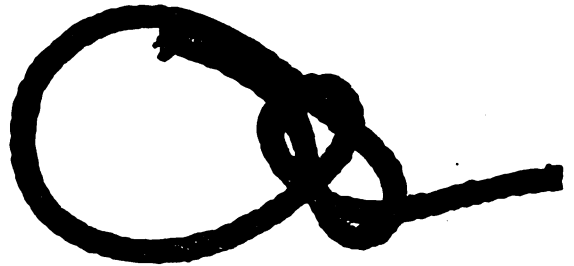
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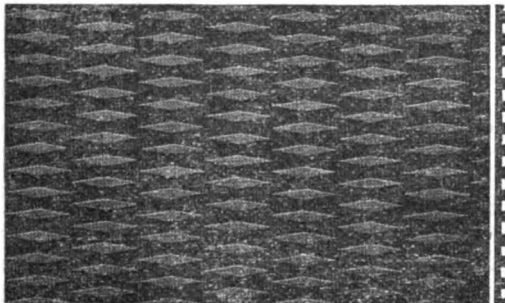
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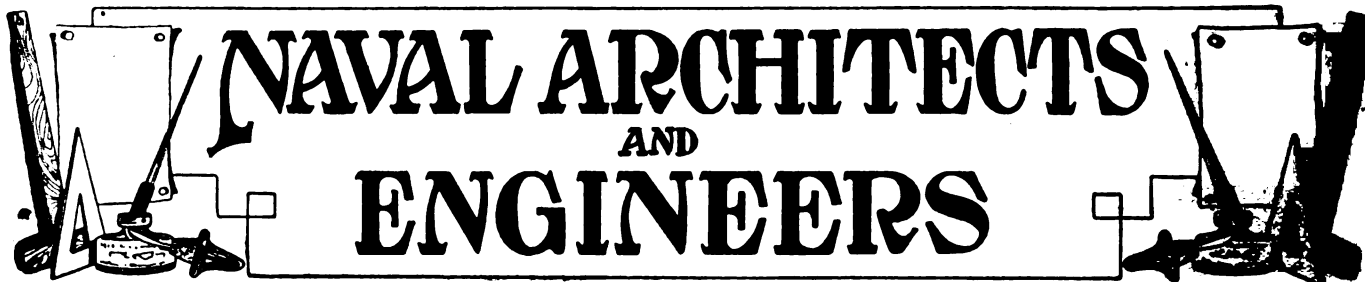
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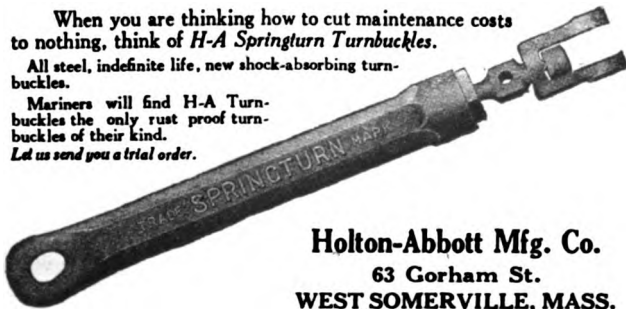
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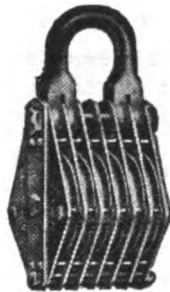


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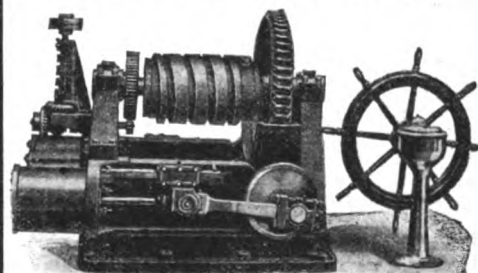
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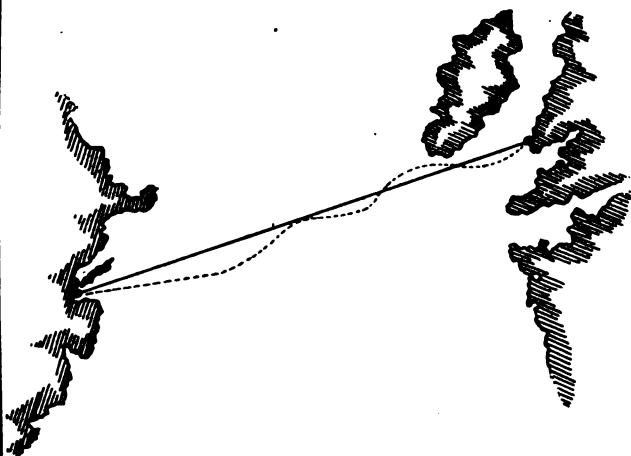
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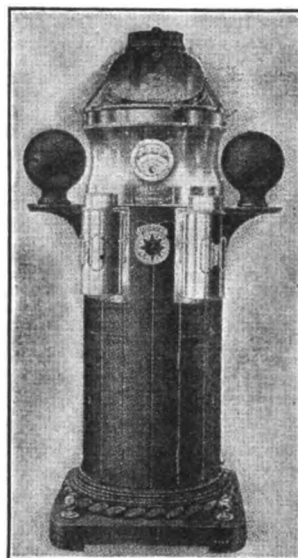
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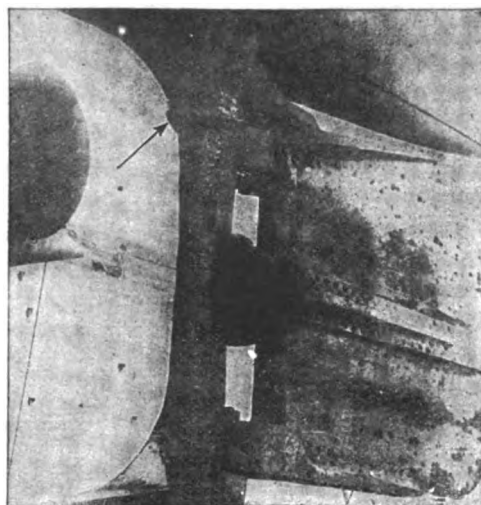
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American Manufacturing Co., Noble and West Sts., Brooklyn, N. Y.
Waterbury Co., 63 Park Row, New York City.
Whitlock Cordage Co., 46 South St., N. Y. C.
- TOWING LINES (Wire)**
Hobbs, Clinton E., Co., Boston, Mass.
Waterbury Co., 63 Park Row, New York City.
- TOWING MACHINES**
American Engrg. Co., Philadelphia, Pa.
Lidgerwood Mfg. Co., 96 Liberty St., New York City.

Please mention THE MARINE REVIEW when writing to Advertisers

TRACING CLOTH

New York Blue Print & Paper Co.,
102 Reade St., New York

TRAMWAYS (Aerial, Wire Rope)

Waterbury Co., 63 Park Row, New York City

TRANSMISSION (Rope) See ROPE (Transmission)

TRANSPORTATION

Equity Steamship Co.,
11 Broadway, New York City, N. Y.

TRAPS (Steam, Air, Vacuum)

American Blower Co., Detroit, Mich.
Anderson, The V. D., Co., Cleveland, O.
Crane Company, The, 836 S. Michigan Ave., Chicago

TREADS (Stairs and Ladders)

Irving Iron Works Co., Long Island City, N. Y.

TROLLEYS

The Chisholm-Moore Mfg. Co., Cleveland, Ohio.
Shepard Electric Crane & Hoist Co.,
Montour Falls, N. Y.

TUBES (Boiler)—See BOILER TUBES

TUBES (Plain and Stay)

Tyler Tube & Pipe Co., The, Washington, Pa.

TURBINE SHAFTS

Titusville Forge Co., Titusville, Pa.

TURBINES

Falk Co., The, Foot of E. 30th St., Milwaukee.
Fletcher, W. & A., Company,
12th to 14th St., Hoboken, N. J.
Kerr Turbine Co., Wellsville, N. Y.
Sun Company, Finance Bldg., Philadelphia, Pa.

TURBINES (Electrical)

General Electric Co., Schenectady, N. Y.

TURBINES (Steam)

Bethlehem Shipbuilding Corp., Bethlehem, Pa.
Delaval Steam Turbine Co., Trenton, N. J.
Kerr Turbine Co., Wellsville, N. Y.
Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

TURBO GENERATORS

Kerr Turbine Co., Wellsville, N. Y.

TURNBUCKLES

Helton-Abbott Mfg. Co.,
61 Gorham St., West Somerville, Mass.

UNIONS

Crane Company, The, 836 S. Michigan Ave., Chicago
Mark Mfg. Co., 1901 Dempster St., Evanston, Ill.

UNTARRED ROPE OAKUM

Stratford, Geo., Oakum Co., Jersey City, N. J.

VALVE RESEATERS

Chadburn (Ship) Telegraph Co.,
5th and Liberty Sts., Troy, N. Y.

VALVES

Jerguson Gage & Valve Co.,
Winter Hill, Somerville, Mass.
Kerr Machinery Corp., Kerr Bldg., Detroit, Mich.

VALVES AND FITTINGS

Ashton Valve Co., 161 First St., Cambridge, Mass.
Auld Co., The, Philadelphia, Pa.
Crane Company, The, 836 S. Michigan Ave., Chicago
Dew Valve Company, Inc.,
149 Broadway, New York, N. Y.
Lunkenheimer Co., The, Cincinnati, O.
Penberthy Injector Co., Detroit, Mich.
Powell, Wm., The,
Spring Grove Ave., Cincinnati, O.
Schutte & Koerting Co., Philadelphia, Pa.
Scully Steel & Iron Co., Chicago, Ill.

VALVES (Balance and Float)

Mason Regulator Co., Boston, Mass.

VALVES (Blow Off)

Dew Valve Company, Inc.,
149 Broadway, New York, N. Y.

VALVES (Condenser, Pump, Rubber)

Dew Valve Company, Inc.,
149 Broadway, New York, N. Y.
Goodrich, E. F., Co., Akron, O.
United States Rubber Co.,
1790 Broadway, New York

VALVES (Drain)

Dew Valve Company, Inc.,
149 Broadway, New York, N. Y.

VALVES (Reducing)

Mason Regulator Co., Boston, Mass.

VARNISH (Marine)

Upson-Walton Co., The,
1310 West 11th St., Cleveland, Ohio.

VENTILATING SYSTEMS

American Blower Co., Detroit, Mich.
Schutte & Koerting Co., Philadelphia, Pa.

VENTILATORS

Farrell & Curry, 70 Ohio St., Buffalo, N. Y.

VESSEL AGENTS

Vance & Joys Co.,
1004-1008 First Nat'l Bk. Bldg., Milwaukee

VESSEL AND INSURANCE AGENTS

Boland & Cornelius,
1204 Prudential Bldg., Buffalo, N. Y.
Richardson, W. C., & Co.,
816-818 Leader-News Bldg., Cleveland.
Vance & Joys Co.,
1004-1008 First Nat'l Bk. Bldg., Milwaukee

VESSEL BROKERS

Chicago Steamboat Exchange, Chicago, Ill.
Farley, Edward P., Co.,
1501 Railway Exchange Bldg., Chicago
Richardson, W. C., & Co., Cleveland, O.

VESSEL FITTINGS

Kerr Machinery Corp., Kerr Bldg., Detroit, Mich.

WALKAWAY GRATINGS. See GRATINGS (for Floors, Walkways, etc.)

WAREHOUSES

Van Dam Warehouse Co., 29 Broadway, New York

WASHERS (Iron and Steel)

Frank Henry, Jr.,
847 Hudson St., New York City
Milton Mfg. Co., Milwaukee, Wis.

WATER GAGES

Jerguson Gage & Valve Co.,
Winter Hill, Somerville, Mass.

WATER JET EDUCATORS

Schutte & Koerting Co., Philadelphia, Pa.

WATER PURIFICATION SYSTEMS

Griscom-Russell Co., 2121 West St. Bldg., N. Y. C.
Jewell Polar Co.,
565 K West Van Buren St., Chicago, Ill.
Schutte & Koerting Co.,
12th and Thompson St., Philadelphia

WATERPROOFING CANVAS

Robeson Preserve Co., Port Huron, Mich.

WELDERS (Electric Arc)

Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa.

WELDING (Custom)

Linde Air Products Co., 42nd Street Bldg., N. Y. C.
Orxwell Acetylene Co., Newark, N. J.

WELDING (Electric)

Morse Dry Dock & Repair Co.,
Foot of 56th St., Brooklyn, N. Y.
Vulcan Iron Works, Inc., Jersey City, N. J.

WELDING (Thermit, Heavy Sections)

Metal & Thermit Corp.,
120 Broadway, New York City, N. Y.

WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

Air Reduction Sales Co., 120 Broadway, New York
Orxwell Acetylene Co., Newark, N. J.
Prest-O-Lite Co., Inc., 30 E. 42nd St., N. Y. C.
Vulcan Iron Works, Inc., Jersey City, N. J.

WELDING GLASSES

Orxwell Acetylene Co., Newark, N. J.

WELDING METALS

Cramp, Wm., & Sons Ship & Eng. Bldg. Co.,
Philadelphia, Pa.

WELDING RODS

Cramp, Wm., & Sons Ship & Engine Bldg. Co.,
Philadelphia, Pa.
Orxwell Acetylene Co., Newark, N. J.
Prest-O-Lite Co., Inc., 30 E. 42nd St., N. Y. C.

WHISTLES

Crane Company, The, 836 S. Michigan Ave., Chicago
Lunkenheimer Co., The, Cincinnati, O.

WHISTLES (Steam)

American Steam Gauge & Valve Mfg. Co.,
Camden St., Boston, Mass.

WINCHES

American Engineering Co., Philadelphia, Pa.
Chisholm-Moore Mfg. Co., The, Cleveland, Ohio.
Flory, S. Mfg. Co., Bangor, Pa.
Haddfield-Penfield Steel Co., The, Bucyrus, Ohio.
Hyde Windlass Co., Water Street, Bath, Maine.
Kerr Machinery Corp., Kerr Bldg., Detroit, Mich.
Morse Dry Dock & Repair Co.,
Foot of 56th St., Brooklyn, N. Y.
Shepard Electric Crane & Hoist Co.,
Montour Falls, N. Y.
Superior Iron Works, Superior, Wis.

WINDLASSES

American Engrg. Co., Philadelphia, Pa.
American Ship Building Co., Cleveland, O.
Carpenter, Geo. B., & Co., 436 N. Wells, Chicago.
Dake Engine Co., Grand Haven, Mich.
Flory, S. Mfg. Co., Bangor, Pa.
Haddfield-Penfield Steel Co., The, Bucyrus, Ohio.
Hyde Windlass Co., Water Street, Bath, Maine.
Lidgerwood Mfg. Co., 96 Liberty St., New York.
Superior Iron Works Co., Superior, Wis.
Wilcox, Crittenden & Co., Middletown, Conn.

WINDOWS (Frameless)

Chadburn (Ship) Telegraph Co.,
5th and Liberty Sts., Troy, N. Y.

WIRE AND WIRING DEVICES

General Electric Co., Schenectady, N. Y.
Western Electric Co., 195 Broadway, N. Y. C.

WIRE ROPE

Durable Wire Rope Co.,
93 Pearl St., Boston, Mass.
Leschen, A., & Sons Rope Co., St. Louis, Mo.
Waterbury Co., 63 Park Row, New York City.

WIRE ROPE AND FITTINGS

Durable Wire Rope Co., 93 Pearl St., Boston.

WIRELESS SETS AND APPARATUS

Cutting & Washington Radio Corp.,
6 West 48th St., New York
Radio Corp. of America, Woolworth Bldg., N. Y. C.

WOOD BORING MACHINES. See MACHINERY (Wood Boring Pneumatic)

WOODEN SHIP REPAIRS

Tietjen and Long Dry Dock Co., Hoboken, N. J.

WOODWORKING MACHINERY (Shipbuilders') See

MACHINERY. (Shipbuilders' Woodworking)

WRENCHES

Coxs Wrench Co., Worcester, Mass.

YACHT BUILDERS

Bath Iron Works, Ltd., Bath, Maine.
Lane Bros Dry Dock & Mfg. Co., Sandusky, O.

YACHT ROPE

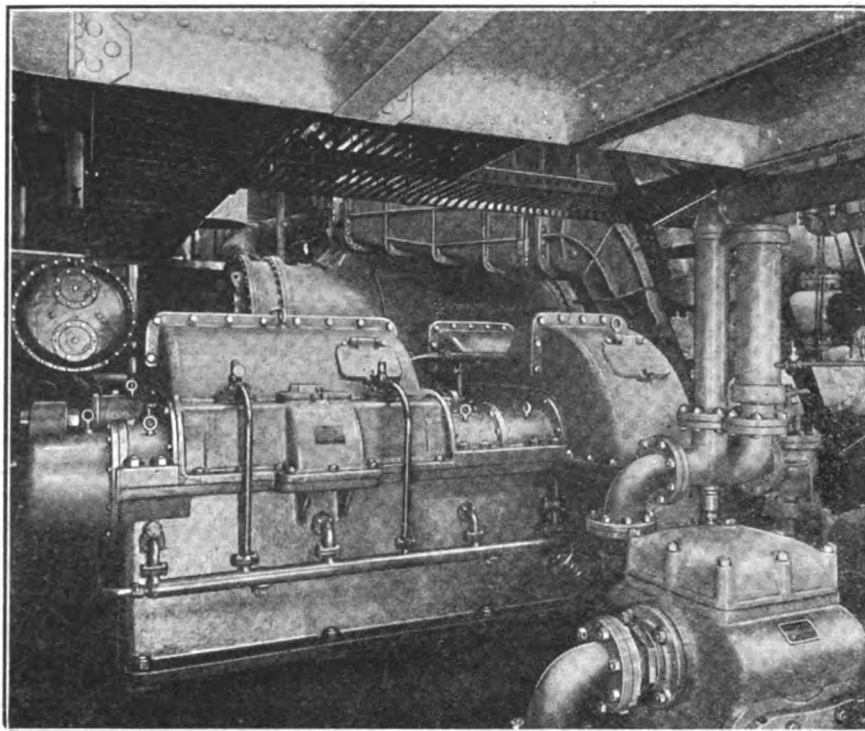
American Manufacturing Co.,
Noble and West Sts., Brooklyn, N. Y.
Whitlock Cordage Co., 46 South St., N. Y. C.

YARN (Lath, Fodder)

American Manufacturing Co.,
Noble and West Sts., Brooklyn, N. Y.
Waterbury Co., 63 Park Row, New York City

KERR ECONOMY

MARINE EQUIPMENT



2650 S.H.P. Kerr Economy Propulsion Turbine and Gears - Engine room
S.S. "Westward Ho."

MANUFACTURERS
OF
SINGLE OR CROSS COMPOUND
MULTISTAGE TURBINES
WITH
SINGLE OR DOUBLE REDUCTION GEARS

CAPACITIES UP TO 6,000 S.H.P.

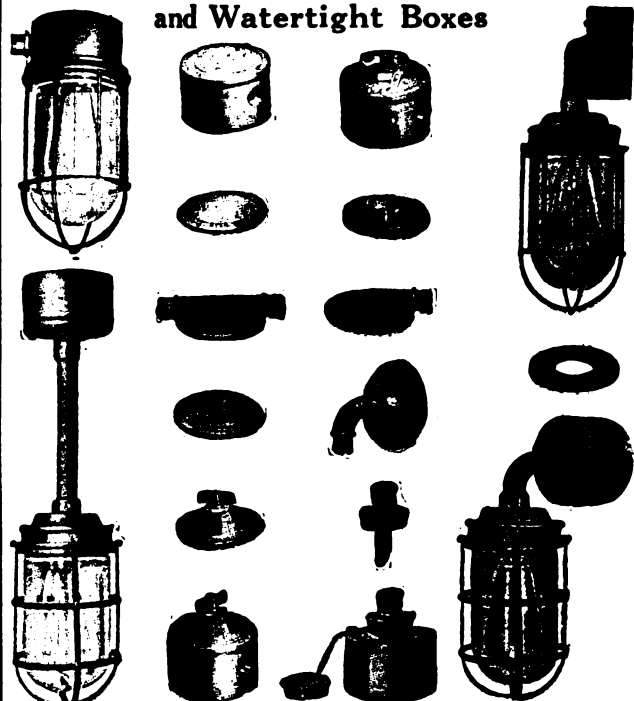
ALSO TURBINE DRIVEN AUXILIARIES SUCH AS TURBO GENERATORS, PUMPS, BLOWERS, ETC.

KERR TURBINE COMPANY

WELLSVILLE, NEW YORK, U. S. A.

Atlantic Coast Marine Dept., 30 Church St., New York City

CONVERTIBLE MARINE ELECTRIC FIXTURES and Watertight Boxes



Standard types with new features—Advantageous to Ship Builders and Ship Owners
—Simplifies construction—Reduces cost of maintenance
Send for Catalogue No. 15 M-R for Complete Line
MANUFACTURERS

SEIDLER-MINER CO., 34-36 East Larned St.
Detroit, Mich., U.S.A.
Hockett L. Parker, Pacific Coast Agent, 111 New Montgomery St., San Francisco, Cal.



**PULLMAN
UNIT
SASH BALANCE**
for Marine Work

ESPECIALLY suitable for vessels of all kinds from yachts and ferry boats to ocean liners and naval vessels.

The Pullman Unit Balance is a simple and effective device for perfectly balancing window sash; it works smoothly and is practically noiseless.

The Pullman Balance has been in use successfully for over thirty years. Our ten year guarantee goes with every Balance.

Made of Pressed brass. Working parts entirely enclosed.

Write for Descriptive Catalog, showing method of installation.

PULLMAN MFG. COMPANY
5 Industrial Street
Rochester, N. Y.

A QUALITY PRODUCT

THE AIRPORT

We are offering great inducements on our highest grade AIR PORTS.

We carry constantly on hand a large stock in all sizes for either Ferris Type or Steel Vessels.

Write for prices and description.

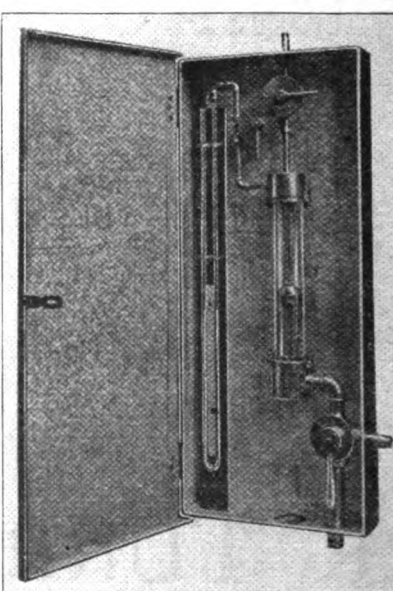
GEO. B. CARPENTER & Co.
MARINE SUPPLIES
436 No. Wells St. Chicago



Keep tabs on your fuel oil

THE MERRICK

Tank Gauge and Draft Indicator



removes any possibility of trouble developing from insufficient fuel oil aboard. Guaranteed accuracy, reliability and safety. Simple and durable. Elimination of Guesswork insures a maximum cargo always with the consequent greater profits.

CAN BE INSTALLED WHILE SHIP IS ALONGSIDE OF DOCK TO LOAD OR DISCHARGE.

You have a problem that the "Merrick" can solve. Let us tell you more.

A.A. Merrick Company, Inc.
Real Estate Trust Building Philadelphia, Pa.

Please mention THE MARINE REVIEW when writing to Advertisers

UNITED STATES ARMY TRANSPORTS FOR SALE

WAR DEPARTMENT SURPLUS PROPERTY

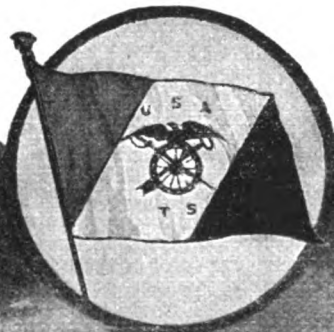
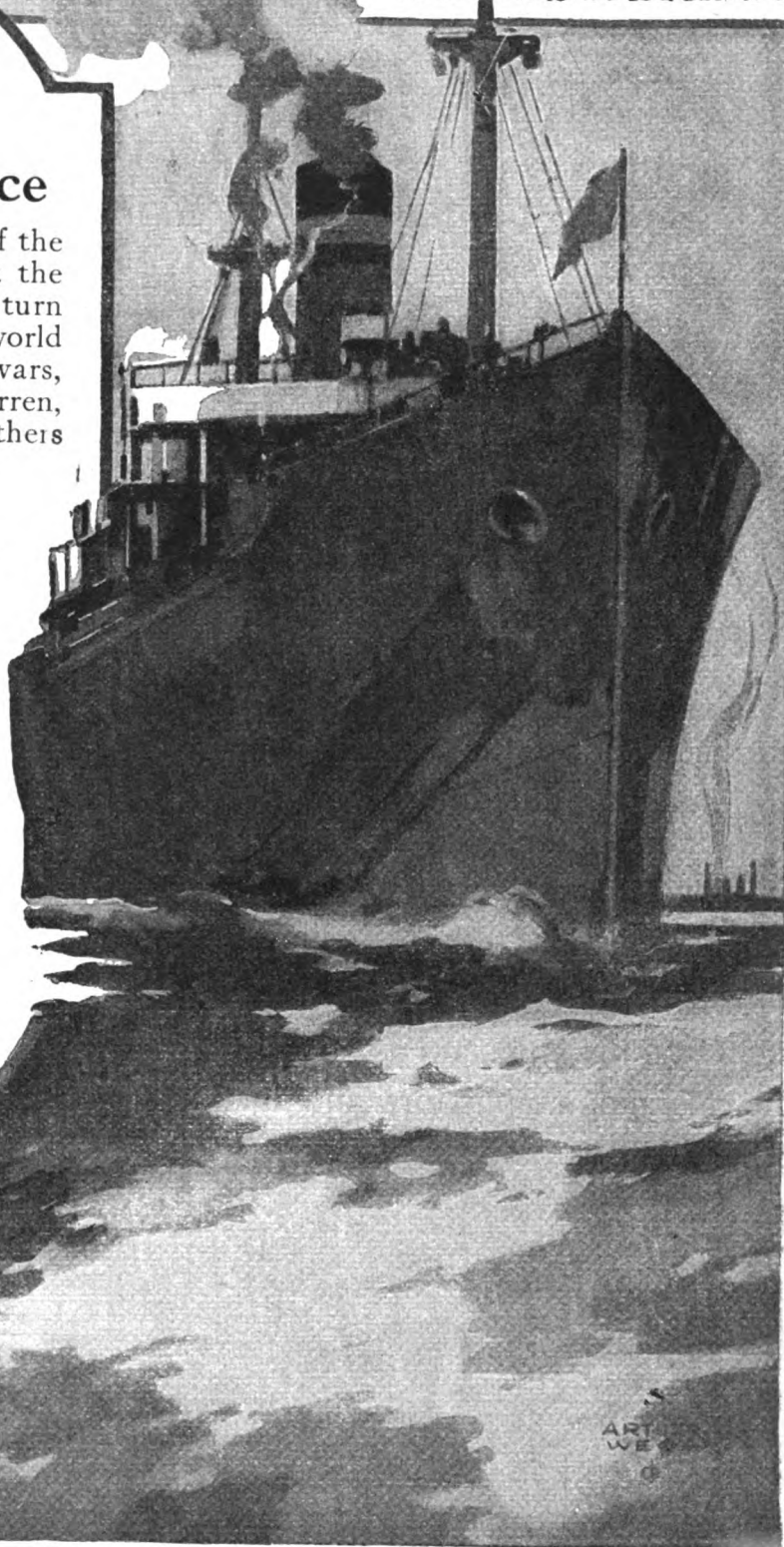
Back to the Lanes of Commerce

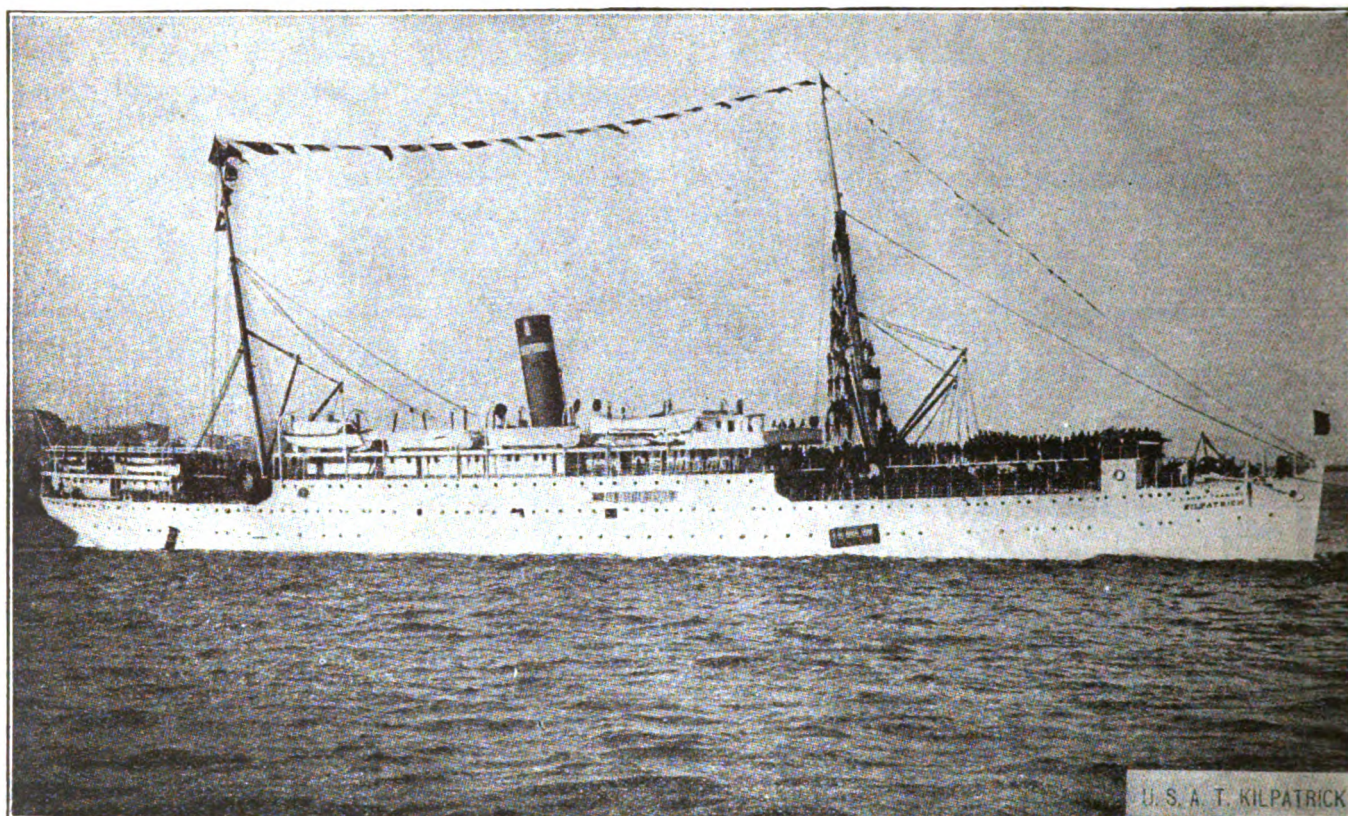
IT will stir the imagination of the shipping world to learn that the United States Army is about to turn back to the commerce of the world those fine old veterans of two wars, the transports Meade, Warren, Crook and Kilpatrick with five others at a later date.

Carrying the halo of a glorious past, they stand ready to shoulder the burden of the congested freight of the world.

The War Department has decided to place these vessels before the shipping world with no hampering restrictions regarding trade routes or freight rates, and with the understanding that at the option of the purchaser either American or British registry may be obtained.

Points of compelling interest are briefly covered on the following pages.





U. S. A. T. KILPATRICK

ALL vessels have full marine equipment—except for navigation instruments, which are not included in the sales. They are completely outfitted for passenger service.

Included in the equipment are steward's fittings, napery, silverware, galley equipment, boat-swains' stores, general supplies, life boats and launches, life belts and rafts, military standees for the steerage, evaporators and distillers, and many other items.



U. S. Army Transport "KILPATRICK"

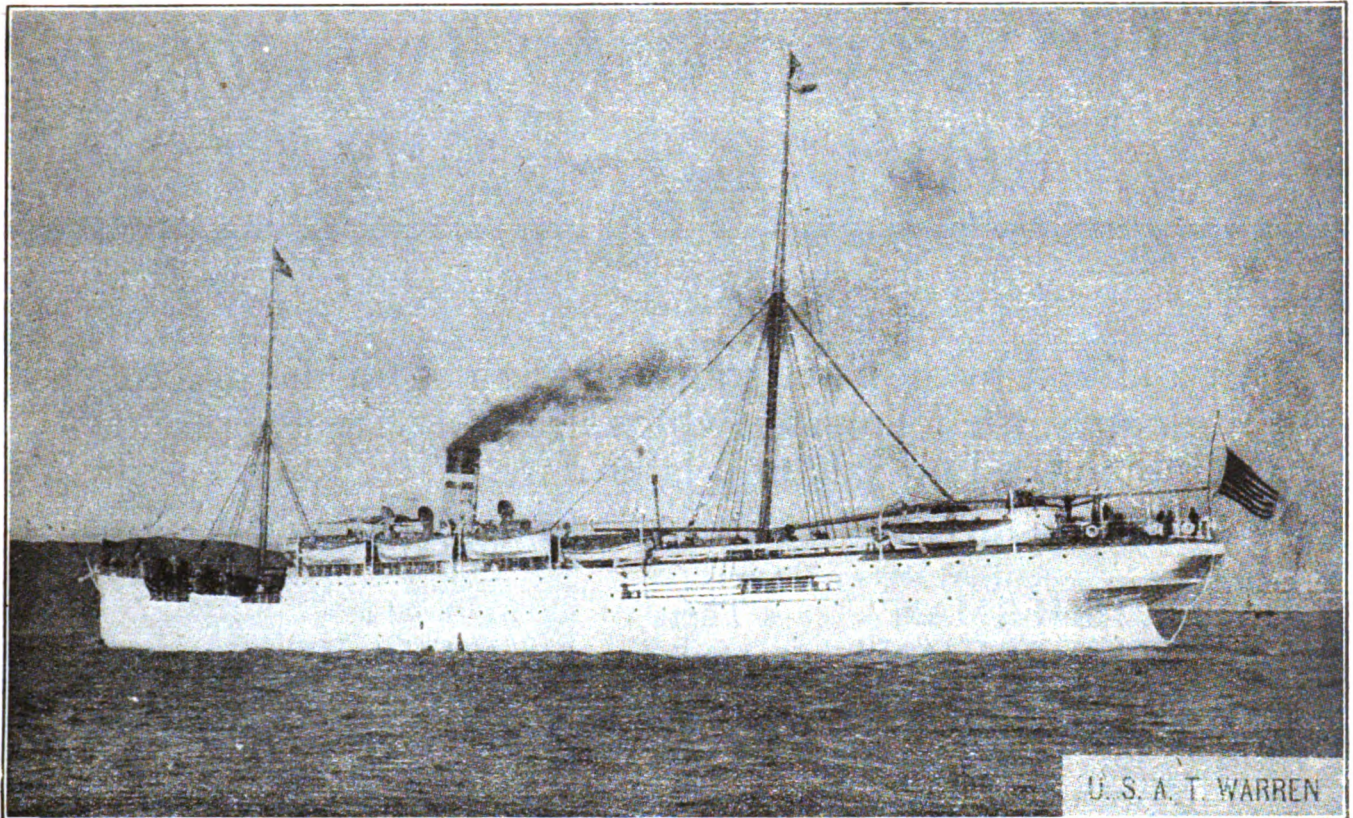
Formerly the British S. S. "Michigan", built in 1890 at Belfast, Ireland, by Harlan & Wolf. The "Kilpatrick" is a schooner rigged ship of 5045 gross tons ready to travel under her own steam; her hull is of steel and single bottom and in fair condition throughout. Also is equipped with Scotch Marine boilers and single screw, triple expansion engine of 2300 I. H. P.

U. S. Army Transport "CROOK"

Was built in Scotland by Murry and Company in 1882 and operated as the SS Roumania under British registry.

This boat is of schooner rig, steel hull, single bottom construction, and 4,126 gross tons. This vessel is ready to steam under her own power at from 10 to 13 knots an hour. Her cargo capacity is 4,188 tons with 10,800 cubic feet of cold storage.

Was reconditioned in 1915 and fitted with large hatches for service under the Alaska Railway Commission. Well suited for West Coast Trade.



U. S. Army Transport "WARREN"

4234 Gross Tons. Equipped and ready to sail.

Steel hull, double bottom, two masted schooner rig, one funnel. Formerly the German S. S. "Scandia" of the Hamburg-American line. Built in 1889, purchased by the War Department in 1898, extensively altered in 1899. Overhauled and repaired in 1901, re-conditioned in 1914. Three decks, three island type of superstructure. Water ballast, 555 tons. Triple expansion engines of 2200 I. H. P. Single bronze bladed screw. Babcock and Wilcox water tube boilers, new 1914. Speed 11 knots. Original rating, Lloyds 100 A-1. Complement, 10 officers 138 crew. Capacity—Fresh water, 114 tons. Bunkers, 1593 tons. Daily consumption, ordinary, 52 tons; high speed, 56 tons. Steaming radius, 5800 miles. Passengers; first class, 48; troops, 386. Cargo, 2910 tons. No troops or steerage, 3890 tons. Location, Manila Harbor. Will be delivered at U. S. port if desired and so stated in sales contract. Write for booklet giving full details.

THESE ships are particularly well suited for Pacific Coast and Alaskan trade, either as freighters or as combination freight and passenger carriers.

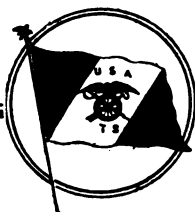
Moderate in size, obtainable at an attractive price, requiring only minor overhauling, and kept in profitable service at a relatively low operating cost, these ships will prove a remunerative investment. They can be used to successful advantage in the South American trade.



Please mention THE MARINE REVIEW when writing to Advertisers

United States Army Transports

For Sale

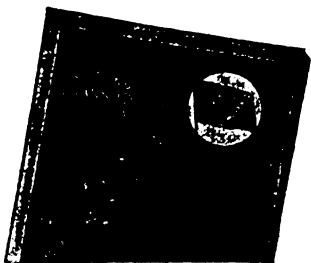


In addition to the three transports named on the preceding pages, the following, which are in service at present, will be placed on sale at a later date.

"BUFORD"		5040 Gross Tons.
	Sister ship to Kilpatrick	
"SHERMAN"	These	5780 " "
"SHERIDAN"	four	5673 " "
"THOMAS"	are	5796 " "
"LOGAN"	sister ships	5672 " "

**Asst. Chief, U. S. Army Transport Service,
DEPT. F,
Pier 2, Hoboken, N. J.**

The "Warren," "Crook" and "Kilpatrick" may be inspected by interested parties at any time. Bids on these three vessels will be received at the above address up to 10 A. M., EASTERN STANDARD TIME, JANUARY 8, 1921. If you will tear off and mail this coupon, you will receive a booklet giving complete information regarding location of the ships (where they may be visited for inspection), their history, construction, deck plans, etc.



U. S. Army Transport Service,
Dept. F, Pier 2, Hoboken, N. J.

Please send booklet on transports to

Firm Name

Street Address

City State

Signed by

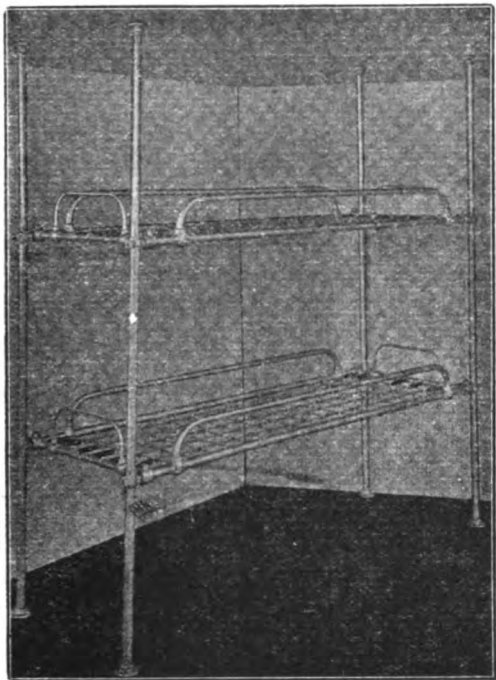
NOTE: This booklet, of course, will be mailed to responsible parties only.



Please mention THE MARINE REVIEW when writing to Advertisers

BERNSTEIN METAL BERTHS

*offer a complete, practical and efficient line.
A berth to successfully meet every condition on board ship.*



Bernstein No. 5553 Third Class Storage and Crew Berth.

Write for catalog No. 17 descriptive of Bernstein Berths, Ship Beds, Bedding and Metal Furniture.

Department R

Bernstein

3rd and Allegheny
Avenue
Philadelphia, Pa.

Chemically Pure Distilled Water

that is sterile and palatable, and fully guaranteed,
can be economically produced by the

Jewell Polar Marine Still

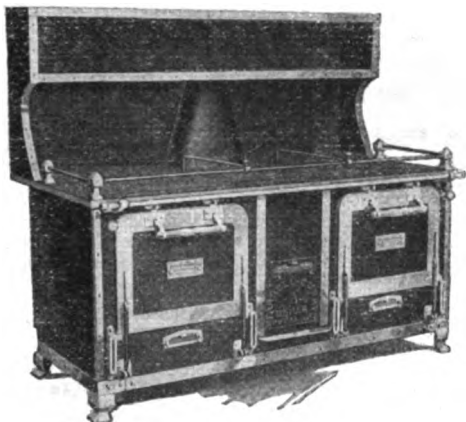
Four hundred vessels are now equipped and, as per guarantee, they conform to requirements of the Shipping Board, U. S. Public Health Service, and all regulations governing water purification systems.

Jewell Polar Stills are easily installed, compact, simple and automatic. They are built in many capacities and thousands are in continuous daily service.

A list of Jewell Polar Stills is a roster of many of the world's best known industrial and other institutions.

*Write for our latest booklet, "The Truth About Water."
It is a straight-from-the-shoulder and easily read explanation of the whole subject of water purification.*

**Jewell
Polar Company**
565K West Van Buren Street
Chicago

**Get Better Cooking Results with Egnar Oven Regulation****EGNAR
WROUGHT STEEL RANGES**

MOST modern Marine and Hotel Ranges made. The Egnar adjustable Oven Regulator equalizes heat in Ovens as desired. Other exclusive features are direct and indirect Draft.

Oven back superheated by scientific baffle plates, extra heavy Asbestos heat insulation, and largest Oven capacity to grate surface. Special air-tight locked seams. Non-warp Oven Bottoms.

Egnar Ranges are made in various sizes. **FREE CATALOG** with complete details sent on request.

FARRELL & CURRY
70 Ohio Street BUFFALO, N. Y.

DRAFTING SUPPLIES

We manufacture a full line of high grade supplies made under our own supervision and always found right.

Also steel tapes, scales, engineering instruments, tracing cloth and paper, drafting room accessories, etc.

*Let us quote on your needs.
Ask for Catalogue G.*

**NEW YORK BLUE PRINT
PAPER CO.**

102 Reade St.  New York City



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Help and Positions Wanted—For Sale and Miscellaneous

"Help Wanted" Advertisements

6c per word—minimum advertisement—\$3.00
All capitals—8c a word—minimum \$4.00

"Position Wanted" Advertisements

4c per word—minimum advertisement—\$1.00
All capitals—5c a word—minimum \$1.25

"For Sale and Miscellaneous" Advertisements

10c per word—minimum advertisement—\$3.00
All capitals—15c a word—minimum \$3.50

Eight (8) words must be added for box address.

To insure insertion, advertisements must reach us by the 9th of the month.

Please have remittance accompany order.

For Sale

FOR SALE SECOND HAND REFITTED READY FOR SERVICE

Twin Screw Outfits				
Two	8-12-20	Triples with one Surface		
10		Condenser and Thrust		
Triple		Expansion Engines		
15-26-44	10-15-25		7½-11-17	
26	22		10	
F. & A. Compound				
22-44	20-40	14-28	10-20	6-11
24	24	18	14	10

Water Tube Boilers
Four B. & W. 3080 sq. ft. H.S. each
Two B. & W. 4100 sq. ft. H.S. each

Scotch Boilers

One 10 1/2 x 11, 175 steam
One 10 1/2 x 9, 180 steam
Two 11 1/2 x 9, 175 steam

Direct Connected Lighting Sets

2 1/4, 4, 5, 7 1/2, 8, 15 K.W. 110 volts

Steam Capstans

Cylinders: 8 x 8, 7 x 8, 6 x 8

Surface Condensers

200, 270, 360, 450, 525, 1000, 2000,
4500 sq. ft. C.S.

Deck Winches

8 x 8 with two Friction Drums and two
Winch Heads on one shaft

Windlasses

Duke for 1 1/4" Chain.

Hyde 8 x 8 cylinder with 180 fathom 1 1/4"
Chain and two 5000 lb. Baldt Anchors.

Miscellaneous

Wireless Outfit, Search Lights, Engine Room
Telegraphs, Bliss Logs, Whistles, Korting In-
jectors, 1"-3", Binnacles with Spirit Com-
passes, Reilly Evaporators, Fresh Water Dis-
tillers, Brass Deck Plates, Dead Lights,
Heaters, Blowers.

Immediate Delivery

MARVIN BRIGGS, INC.,

167 Sixth St. Brooklyn, N. Y.

For Sale

MAKE AN OFFER ON A 15-PERSON LIFE RAFT
taken from Chief Wawatam on account of reclassifi-
cation. Thoroughly equipped and in A-1 condition.
THE MACINAC TRANSPORTATION CO., ST. IG-
NACE, MICH.

FOR SALE—2 TUGS—60 FT. LONG, 150 LB.
steam pressure. Ready for work. Capt. W. Garrison,
2156 Madison avenue, New York. Telephone Harlem 4.

FOR SALE

Complete 2 Cu. Yd. Dipper Dredge—Ex-
cellent Running Condition. Small Deck Scow
and Bottom Dump Scows. Price Reason-
able.

For particulars call or write

JOHN P. RANDERSON,

51 State St.

Albany, N. Y.

MODERN MARINE MACHINERY

Automatic Steam Towing Engines, Windlasses,
Car-o and Deck Winches, Deck Gypsies, Capstans,
etc. Write Corbet Foundry & Machine Co., Owen
Sound, Canada.

FOR SALE

9 CHRONOMETERS, \$275.00 to \$400

4 SEXTANTS, \$65.00 to \$150.00

3 pair MARINE GLASSES, \$20.00 to \$75.00

LESTER CERF

47-49 Maiden Lane, New York

DREDGE

FOR SALE

Fairbanks 1 1/2 Cubic Yard Dipper dredge.

All steel sectional hull—50 foot boom—

Hull 75 feet long, 32 feet wide, 7 feet

deep. Brand new, never been used. Cheap.

Wabash Portland Cement Co.,

Ford Bldg., Detroit, Mich.

For Sale

16 CABLEWAY EQUIPMENTS FROM L. H. SHAT-
TUCK, INC., SHIPYARD, NEWINGTON, N. H.

16 7x10 double drum Stroudsburg engines fitted with
link motion. Drums 24"x24" with rear end ha-
ving concave ends for transferring line.

32 Oregon Pine Masts 72' to 92' long. Average
dia. 17".

50,000 ft. 3/4" 6x19 C. S. Wire Cable.

15,000 ft. 1 1/4" 6x19 C. S. Hauling Wire Cable.

50,000 ft. 1 1/4" Cableway Wire Cable.

And all the Clips, Guys, Blocks, Shackles, Shear-
Frames, etc., from the above plant. All this equip-
ment is practically new and ready for immediate
delivery. Inspection is welcomed.

THE PERRY, BUXTON, DOANE CO.,

214 West First Street,

South Boston, Mass.

REBUILT ENGINES

In Stock for Immediate Delivery

	H.P.	Size	Cyl.	Price
Standard	300	12x14	6	\$3800
Standard	300	10x10 1/2"	6	\$4000
Standard	100	8x10	6	\$2800
Standard	75	8x10	4	\$2200
Standard	37	6x8	4	\$1160
Craig	300	11x15	6	\$2600
		Pair.....		\$5000
Craig	125	11x15	4	\$2000
Craig	120	8 1/2 x 7	6	\$1600

Above Engines have full equipment as
Propeller—High Tension Ignition, Carburetor
—Oiling system, Reverse gear, complete from
Flywheel to coupling.

HAMILTON

MARINE ENGINE EXCHANGE, INC.

440 Fifty-Second Street, Brooklyn, N. Y.

DREDGE

FOR SALE

Fairbanks 1 1/2 Cubic Yard Dipper dredge.

All steel sectional hull—50 foot boom—

Hull 75 feet long, 32 feet wide, 7 feet

deep. Brand new, never been used. Cheap.

Wabash Portland Cement Co.,

Ford Bldg., Detroit, Mich.

BENDING SLAB

Bending slab for sale, sections 5 feet
square, weight 2800 lbs. each—machine
surface.

Whitehead & Kales Co.,

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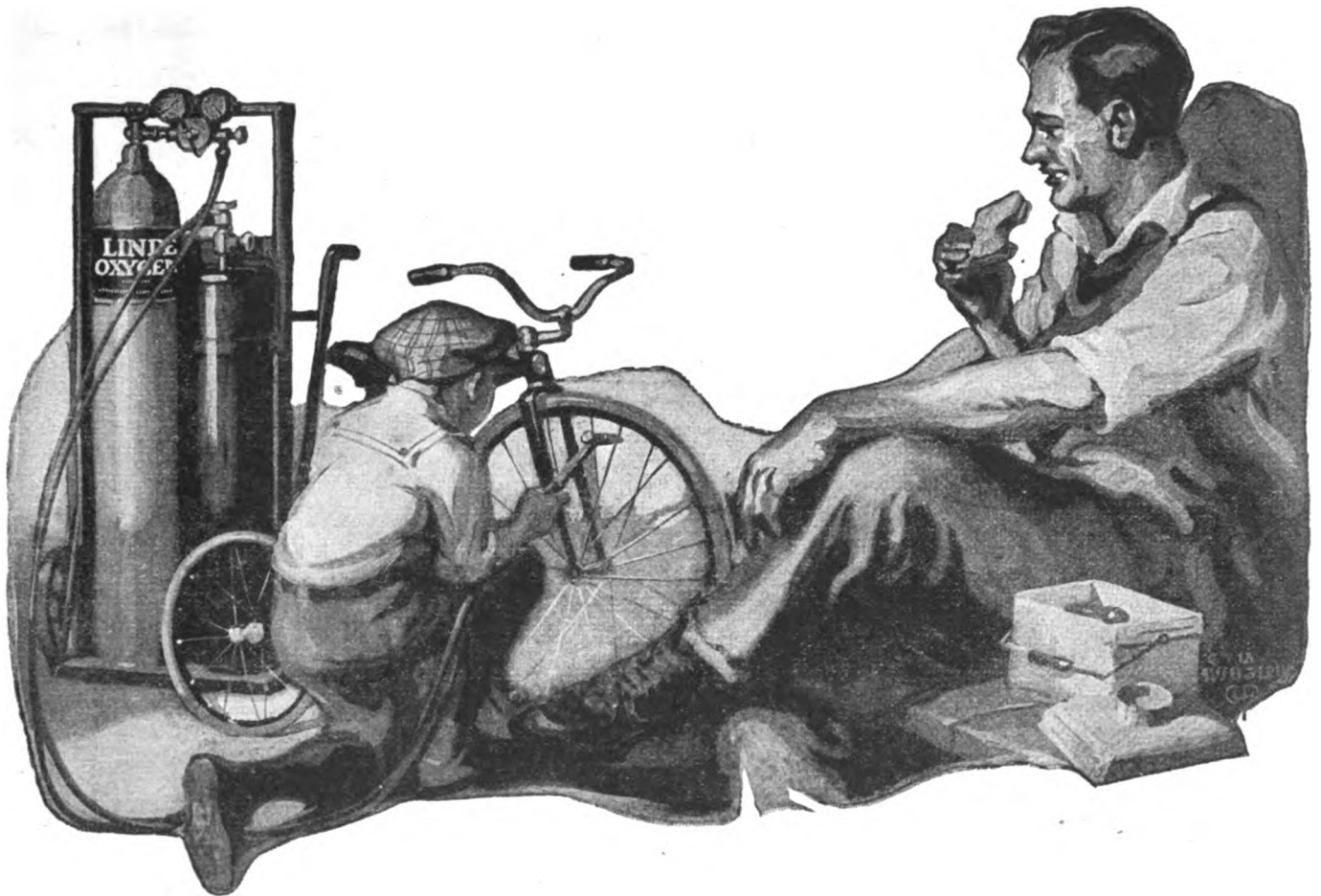
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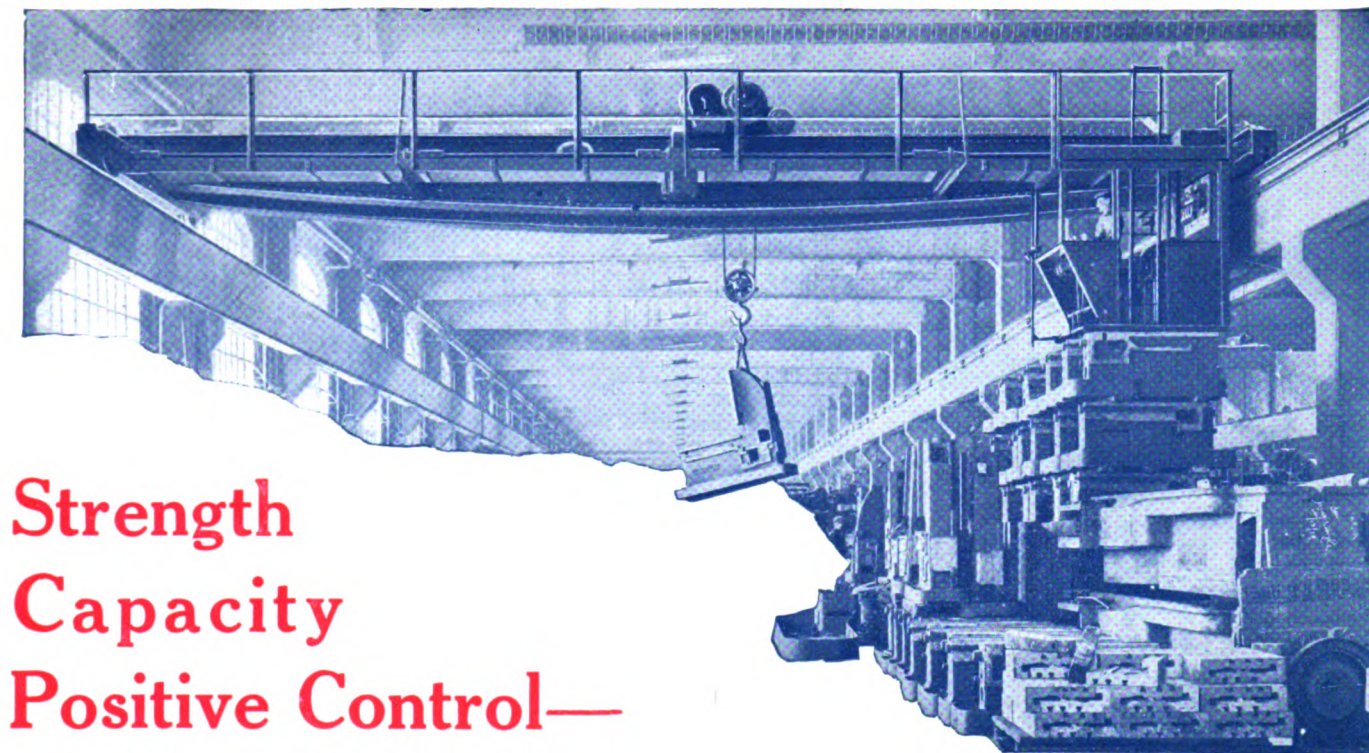
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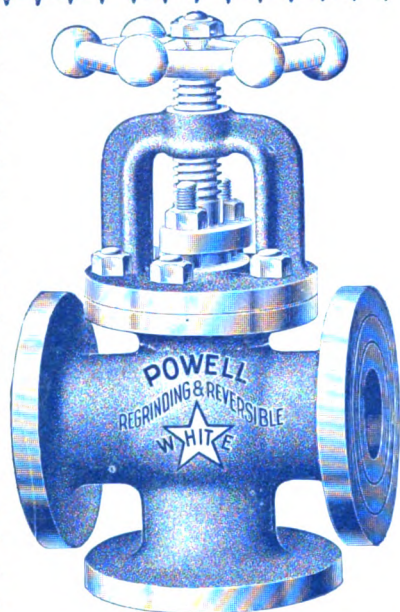
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